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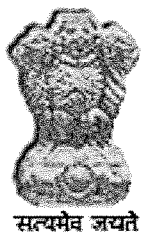
DERAILMENT IN INDIAN RAILWAYS

MINISTRY OF RAILWAYS

PUBLIC ACCOUNTS COMMITTEE
(2023-24)

ONE HUNDRED AND THIRTY SECOND REPORT

SEVENTEENTH LOK SABHA



LOK SABHA SECRETARIAT
NEW DELHI

PAC NO. 2362

ONE HUNDRED AND THIRTY SECOND REPORT

PUBLIC ACCOUNTS COMMITTEE
(2023-24)

(SEVENTEENTH LOK SABHA)

DERAILMENT IN INDIAN RAILWAYS

(Ministry of Railways)

Presented to Hon'ble Speaker, Lok Sabha on: 27.02.2024

Presented to Lok Sabha on:

Laid in Rajya Sabha on:

LOK SABHA SECRETARIAT
NEW DELHI

February 2024/ Phalguna 1945 (Saka)

Contents

COMPOSITION OF THE PUBLIC ACCOUNTS COMMITTEE

(2023-24)

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LOK SABHA

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3. Shri Subhash Chandra Baheria
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Secretariat

1. Shri Sanjeev Sharma - Joint Secretary
2. Shri Partha Goswami - Director
3. Dr. Faiz Ahmad - Under Secretary

[1] Elected w.e.f. 19.08.2023 consequent upon retirement of Shri Sukhendu Sekhar Ray, MP on 18.08.2023.

INTRODUCTION

I, the Chairperson, Public Accounts Committee (2023-24), having been authorised by the Committee, do present this Hundred-First Report (Seventeenth Lok Sabha) on **"Derailment in Indian Railways"** based on C&AG Report number 22 of 2022 relating to the Ministry of Railways (Railway Board).

2. The Report of Comptroller and Auditor General of India was laid in the Parliament on 20 December 2022.

3. The Public Accounts Committee (2023-24) selected the subject for detailed examination and report during their current term i.e. 2023-24. The Committee took oral evidence of the representatives of the Ministry of Defence and Indian Navy at their sitting held on 18.07.2023. The Public Accounts Committee (2023-24) considered and adopted this Report at their sitting held on 05.02.2024. The Minutes of the sittings of the Committee are appended to the Report.

4. For facility of reference and convenience, the Observations and Recommendations of the Committee have been printed in **bold** and form Part-II of the Report.

5. The Committee would like to express their thanks to the representatives of the Ministry of Defence and Indian Navy for tendering evidence before them and furnishing the requisite information to the Committee in connection with the examination of the subject.

6. The Committee also place on record their appreciation of the assistance rendered to them in the matter by the Committee Secretariat and the office of the Comptroller and Auditor General of India.

NEW DELHI:
05 February, 2024
16 Magha, 1945 (*Saka*)

ADHIR RANJAN CHOWDHURY
Chairperson,
Public Accounts Committee

PART-I

Introduction

Genesis of Indian Railways and issues involving Derailments/Accidents

1) The first railway proposals for India were made in Madras in 1832. India's first railway line was named Red Hill Railroad and was built by Arthur Cotton to transport granite for road-building. It ran from the Red Hills in Chennai to the Chintadripet bridge in Madras and was opened on 12 September 1837. India's first 33.79-km railway line passenger train service was inaugurated between Bori Bunder, Bombay (now Mumbai) and Thane in 1853.The Indian Railway (IR) is one of the world's largest railways. It functions as a vertically integrated organization providing Passenger and Freight services. It is a single system which consists of 67,956 route km of track that traverses the country. More than 21648 number of trains ply on IR carrying about 22.15 million passengers and hauling nearly 3.32 million tonnes of freight every day. Despite its vast size and complexity, the Indian Railway has a good safety record. However, accidents do occur from time to time. Accidents tarnish image and question safe and sound working procedures of Indian Railway. Accidents occur on account of acts of omission or commission, evasion of rules, unsafe practices, etc. Out of various categories of accidents, most serious consequences are witnessed in collisions, derailments, fire in running trains and level crossings accidents etc.

2) The C&AG Report No. 22 of 2022 for the year that ended in March 2021 contains significant results of the performance audit of Derailment in Indian Railways by the Ministry of Railways of the Union Government from 2017-18 to 2020-21.

3) Public Accounts Committee (2023-2024), selected the aforesaid C&AG Report for examination and report.

4) The Public Accounts Committee (2023-2024), considered the subject for detailed examination, took oral evidences of the representatives and other officials of Ministries of Railways and Civil Aviation on 17 July, 2023 and obtained written replies on the same. Based on the oral evidence and written replies, the Committee examined the subject in detail.

INSPECTIONS AND TRACK RELATED ISSUES

A. Monitoring by Track Recording Cars (PARA 2.2)

5) Audit analysis revealed that there were shortfalls in inspections by Track Recording Cars. It was observed that the shortfall ranged between 30 per cent and 100

per cent in TRC inspections. The shortfall in TRC inspections had adverse consequences on the quality of assets with implications on safe operation of trains on these routes. In one of the inquiry reports, it was noticed that a derailment of Seemanchal Express occurred in February 2019 in ECR wherein it was stated that the TRC run over the section was overdue by four months, which could have given vital inputs for defects in track. The main reasons assigned for the shortfall in the inspections was non-receipt of the programme for the running of TRCs to be prepared and finalized by Research Designs & Standards Organization (RDSO), Lucknow. Thus, non-deployment of TRCs over planned sections, as per schedule, led to non-checking of track parameters having implications on overall safety of train operations including derailments.

6) In their Action taken note, the Ministry have stated as under:

> "Track recording car is a means to carry out super check of track parameters, which are measured and monitored by P. Way Gang, JE, SSE and test checked at ADEN level. To carry out this super check, there were total 5 (five) Track Recording Cars in Indian Railways during 2017-2021. Due to limited number of Cars, required frequency of track recording could not be achieved. In case of non availability of TRC, alternative means i.e. Oscillation Monitoring System is deployed and attention to track is given based on the result. However, two more TRCs have been commissioned thereafter and another one TRC is under commissioning. This will enhance the capacity of track recording. Further sanction of 7nos. TRC has been taken in Works programme and procurement is under process."

7) When the Committee asked to clarify with regard to the number of Track Recording Cars, the Ministry representative, during evidence before the Committee, replied, as under:

> "Sir, there were five earlier and two more have been commissioned. So, we already have a fleet of seven track recording cars. So, in the past, there were some constraints because of shortage of track recording cars. This has been pointed out by the C&AG also that they prescribed that periodicity was not adhered. So, that is why, we have already procured and commissioned two more such cars and more such cars are being commissioned so that we have sufficient fleet."

8) When asked about the desirable ratio of total length of Railway network and the number of Track Recording Cars (TRCs), the Ministry official replied as under:

> "Sir, on an average the annual recording done by one TRC is approximately 35000-40000kms. Hence the total requirement of TRC for year 2024-25 is 7-8 numbers. Therefore, the desirable ratio is one TRC per 15000 kms of BG main line track."

9) When asked as to how many track recording cars are appropriate for maintaining the 67,000 route kilometers, the Ministry representative replied as under:

"Sir, the track recording is required to be carried out depending upon the quantity of traffic running and the importance of individual route. So, we have different periodicity depending upon the categorization of the route. That periodicity ranges from 2 months to one year depending upon the importance and traffic carried. The specific information about our requirement of track recording cars for adhering to prescribed periodicity that we will submit to the Committee."

10) When asked about the reasons attributed for not carrying out timely inspections by Track Recording Cars (TRCs) and non-deployment of TRCs in a timely manner, the Ministry, in their written reply stated as under:

"Annual planning of track recording by TRC is being done by RDSO and the same is issued to all zonal railways at the beginning of every financial year. Monthly track recording plans by each TRC are issued in advance. There has been shortfall of available recording capacity by TRC due to old machines requiring maintenance. The problem was aggravated due to break down, schedule maintenance of Track Recording System, non-availability of path in congested traffic sections etc. Due to this, priority was given for track recording on higher speed routes on Group A and B routes, which resulted in non-recording of certain sections on Group D and Group E routes at stipulated periodicity. Two new Track recording cars have since been commissioned in year 2022-23, thereby adding to the recording capabilities by TRCs. Two more TRCs have been procured."

11) In response to further query as to whether there has been any shortage of permanent way staff, the Ministry, in their written reply stated as under:

"The Permanent way staff associated for operation of TRC is deployed by RDSO. Operation of TRC was not affected any time due to non-availability of Permanent way staff. In order to meet the requirement of Permanent way staff for new TRC, 22 nos. of new Senior Section Engineers and Junior Engineers have been posted in last 2 years for operation of TRC. As such, there is no shortage of permanent way staff for operation of TRC."

12. On being enquired about the consequences of not deploying Track Recording Cars (TRCs) on the planned sections, the Ministry in their written reply stated as under:

"No unsafe situation has been observed in past on shortfall of track recording, as sufficient safeguards are available in this regard."

13. When asked as to why there has been a shortfall in TRC inspections particularly in Group A and B Broad Gauge lines, the Ministry in their written reply furnished the following data and stated as under:

Sl No.	Group	Zone	Number of inspections due as per CAG Report	Frequency as per IRPWM	Number of inspections due as per IRPWM	Number of inspections done	Shortfall	% Shortfall

1.	A	ER	48	Once in 3 months & Once in 4 months	28	20	8	29
2.	B	CR	16	Once in 4 months	24	15	9	38
3.		ECR	40	Once in 4 months	12	7	5	42
4.		NCR	64	Once in 4 months	24	11	13	54
5.		SCR	16	Once in 4 months	36	17	19	53
6.		SER	32	Once in 4 months	12	4	8	67
7.		WR	16	Once in 4 months	24	13	11	46

"The reason for shortfall was due to old machines requiring maintenance. The problem was aggravated due to break down, schedule maintenance of Track Recording system, non-availability of path on congested traffic sections etc. Now, 2 new TRCs have been commissioned and 2 new TRCs have been recently procured."

14. When enquired about reasons for non-preparation of programmes for running of TRCs by Research Designs & Standards Organization (RDSO), Lucknow, the Ministry explained in a written reply as under:

"Every year in the month of February, yearly Master Plan for forthcoming year including a monthly recording programme by each TRC is prepared by RDSO and issued to all Zonal Railways. Detailed programme of recording to be done by each TRC based on the above Master Plan is issued and circulated to concerned Zonal Railways. The preparation of the programme for running of TRCs by RDSO, Lucknow has been done timely. However, due to requirement of maintenance of TRC machines, entire network could not be covered. Now, 2 new TRCs have been commissioned and 2 new TRCs have been recently procured."

15. When the Committee desired to know as to what steps have been taken by the Ministry to ensure that RDSO, Lucknow invariably submit the roadmap for running TRCs in time, the Ministry in their written reply stated as under:

"With 2 TRCs commissioned during 2022-23 and 2 more procured recently, the situation has improved. RDSO has already issued the master plan for deployment of TRC for 2023-24."

16. On being enquired about the measures initiated to prevent negligence in carrying out TRC programmes, the Ministry, in their written reply stated as under:

"There has not been any negligence in carrying out the TRC programmes, as it got deferred due to maintenance of old Track recording cars. Now, 2 new TRCs have been commissioned and 2 new TRCs have been recently procured."

17. On being asked as to what steps have been taken by the Ministry and Zonal Railways to ensure that the frequency for track recording, as mandated in the Indian Railway Permanent Way Manual (IRPWM), is strictly adhered to, the Ministry replied as under:

> "The network of Indian Railways is expanding at much faster pace and sectional speed of existing network is also being increased. Considering the expansion of network, 2 new TRCs have been commissioned, 2 new TRCs have been recently procured and 7 more (04 additional TRCs and replacement of 03 old TRCs) have been sanctioned."

18. On being enquired about the **variations in the monitoring frequency based on the speed bands justification thereof in terms of safety and operational requirements and the steps being taken to improve the compliance with the recommended monitoring frequency for each speed band,** the Ministry explained in a written reply as under:

> "The rate of deterioration of track geometry parameters and maintenance efforts are on higher side for tracks under high speed band with respect to tracks on low speed band. Therefore, tracks having higher speed are required to be monitored more frequently for assessing the requirement of maintenance inputs to be given. For the compliance with the recommended monitoring frequency for each speed band, the Indian Railways annual liability of Track Recording by TRCs is calculated and master chart is prepared and circulated to all Zonal Railways. Further, the monthly recording program of TRCs are prepared based on the annual master chart."

19. When asked as to **how does the current ratio of one TRC per 15,000 kms align with international best practices or standards for railway track inspection and whether there are plans to reassess or revise the desirable ratio based on the evolving needs and challenges in track maintenance and safety, the** the Ministry in their written reply stated as under:

> "There is no specified international standard for recording frequency by TRC. Different Railways follow different practices based on their experience and maintenance needs. The current ratio of one TRC per 15,000 kms is calculated based on Indian Railways current track speed bands, their respective frequencies and proportion of track in different speed bands. The ratio shall be reassessed time to time to incorporate the increasing speed of the track sections and increase in track length due to completion of new projects. Keeping in view in future requirement, 04 additional TRCs will be added and 03 old TRCs will be replaced with new TRCs, tender of which has already been invited."

20. When asked to provide detailed data on the frequency of track recording undertaken *vis à-vis* the requirement mandated in the IRPWM during the last five years and whether there has been any shortfall noticed by the Ministry in this regard and the action taken against the officials responsible for the shortfall, the Ministry in their written reply furnished the following data and stated as under:

"Detailed data on the frequency of track recording undertaken vis-à-vis the requirement mandated in the IRPWM during the last five years is as follows:

Year	Requirement as per IRPWM (Km)	Recording done (Km)	%age Recording
2018-19	198817	101222	51%
2019-20	222401	90390	41%
2020-21	232646	179442	77%
2021-22	241342	144720	60%
2022-23	248358	218218	88%

There has been shortfall due to shortage of available recording capacity and maintenance of old TRCs. However, the gap between required testing as per IRPWM and actual testing done is narrowing down over the years, as is evident from above data. To wipe out the shortfall in the inspection by TRCs, following steps have been taken: a) 2 new TRCs have been commissioned and 2 new TRCs have been recently procured. b) 7 more TRCs (04 additional TRCs and replacement of 03 old TRCs) have been sanctioned. It is also submitted that for monitoring the health of the track, additional runs of Oscillation Monitoring System (OMS) have been carried out, which is also one of the systems for inspection of track and gives acceleration peaks and ride index in lieu of track recording by TRCs. As a result, the track was maintained to the desired standards. Details of 5 years of OMS run are given below:

Year	Planned (km)	Progress (km)	% increase
2018-19	711461	747924	5
2019-20	770208	873685	13
2020-21	786263	1087161	51
2021-22	825665	1108648	34
2022-23	869243	1064797	22

21. When asked as to what is the preset mechanism applied by the Indian Railways now to ensure that optimum inspections by Track Recording Cars are carried out and to make sure that no inspection gap recurs and what is the present status of number of inspections being carried out, the Ministry replied as under:

"Comprehensive review has been done for recording capacity requirement and action has been taken to have recording capacity commensurate with the requirement. 2 new TRCs have been commissioned, 2 new TRCs have been recently procured and 7 more TRCs (04 additional TRCs and replacement of 03

old TRCs) have been sanctioned. The monthly programme issued by RDSO is being regularly monitored. There is improvement in track recording in year 2022-23 in which the Track recording liability for the year was 2,48,358 Km and actual recording carried out was 2,18,218 km."

22. On being asked as to how much fund has been allocated by the Indian Railways to conduct TRC inspections in the last five years and whether there is sufficient fund to achieve proper monitoring of tracks by TRCs, the Ministry in their written reply responded as under:

"There is no separate fund allocation for TRC inspections. The consumables and fuel are arranged by concerned Zonal railways for running of TRCs with the available funds of track maintenance with divisions. However, for procurement of TRCs, work is sanctioned in Rolling stock programme and commensurate funds are allotted. As on date, procurement of additional 7 TRCs (4 additional and 3 on replacement account) has been sanctioned at approximate total cost of Rs 170 crores. There has been no shortage of funds."

23. When the Committee sought response of the Ministry in relation to the inquiry report on Seemanchal Express derailment which stated that TRC run over the section could have given vital inputs for defects in the track which could have averted the derailment, the Ministry in their written reply stated as under:

"As per Commissioner of Railway Safety Inquiry report, derailment of Seemanchal Express 12487 UP on 03.02.2019 was primarily caused due to fracture of rail & classified as failure of Railway equipment due to poor construction & maintenance. The responsible officials have been suitably taken up under Indian Railway Disciplinary and Appeal rules. It is brought out that TRC is meant for recording the track geometry parameters and does not detect any rail flaws. Therefore, shortfall in TRC recording has no bearing on this accident. However, the observation of CRS has been taken in a positive way and following steps have been taken to wipe out the shortfall in the inspection by TRCs:

a) 2 new TRCs have been commissioned and 2 new TRCs have been recently procured.

b) 7 more TRCs (04 additional TRCs and replacement of 03 old TRCs) have been sanctioned."

Para No.2.3: Outsourcing of track maintenance activities

24. The Railway Board had specified regular exercise for working out the required strength of Trackman for maintenance by all Zonal Railways every year and institute necessary mechanism for timely filling up of vacancies. It was also specified that track maintenance activities are to be organized either through departmental resources or through outsourcing or a combination of both to meet the entire requirement of track maintenance. Audit had highlighted a number of deficiencies in this regard. The status

of outsourcing was found to be insufficient against the required number of work force of the Civil Engineering Department. The percentage of vacancies in Indian Railways for Civil Engineering Department ranged between 9 to 36 per cent. No outsourcing was done in East Central Railway against the shortage of work force in divisions selected for review. Accident Inquiry reports of the zone revealed that in 23 per cent of the total derailments (40 out of 172) in East Central Railways, one of the factors responsible for the derailment was due to improper track maintenance. In three Zonal Railways, North Central Railways, North Frontier Railway, and West Central Railway, the percentage of vacancies was more than seven percent; however, no outsourcing was done in any of these Zonal Railways.

25. On being enquired about the present status of vacancies of Civil Engineering Department in Indian Railways and necessary action to augment the work force of the Civil Engineering Department taken by the Ministry and concerned zonal railways, the Ministry in their written reply stated as under:

> "The total Non-gazetted Group 'C' (including level – 1) vacancies in Civil Engineering department of Indian Railways as on 01.07.2023 are 68619. During 2018- 2019 to 2022-2023, 11784 (Provisional) candidates have been empanelled in Civil Engineering Department (for Group 'C' posts excluding Level 1) by 21 Railway Recruitment Boards (RRBs)."

26. On being asked about the reasons attributed for the shortage of work force in the civil engineering department, the Ministry in their written reply stated as under:

> "Non-gazetted Group 'C' (including level – 1) vacancies in Track Maintainer Cadre of Indian Railways as on 01.07.2023 are 42189. The vacancies of JE/SSE (P-Way) as on 01.07.2023 are 2141. Occurrence and filling up of vacancies is a continuous process on Indian Railways considering its size, spatial distribution and criticality of operation. The vacancies are filled up primarily by placement of indents by Railways with Recruitment agencies as per operational requirements. During the process, vacancies may arise and these are filled subsequently."

27. When enquired about the procedure followed by the Indian Railway to outsource work relating to track maintenance, the Ministry in their written reply stated as under:

> "During March 2006, 20 activities of track maintenance have been identified for outsourcing and communicated to Zonal Railways. Quantum of work based on the field requirement is worked out by the respective units of the division and estimates are prepared. Based on these estimates, contractual agencies are fixed through open tenders. For assets, which have outlived their prescribed life, works of renewal/replacement viz. Complete Track Renewal (CTR), Through Rail Renewal (TRR), Through Sleeper Renewal (TSR), Through Turnout Renewal (TTR), Through Fittings Renewal (TFR) etc are sanctioned and executed through the outsourced agencies."

28. When asked as to how the railway ensures that the outsourced agency is deploying sufficient number of trained manpower, the Ministry in their written reply stated as under:

> "Condition for deployment of required qualified manpower forms part of the contract agreement as per General Conditions of Contract. Railway Permanent way engineers posted at different sections of the division ensure skilled/trained manpower as per requirement of work. Large numbers of agencies that have developed the expertise over the years are deployed. **Relevant conditions of GCC are reproduced below:**
>
> **26. Provision of Efficient and Competent Staff at Work Sites by the Contractor:**
>
> **26.1 The Contractor shall place and keep on the works at all times efficient and competent staff to give the necessary directions to his workmen and to see that they execute their work in sound & proper manner and shall employ only such supervisors, workmen & labourers in or about the execution of any of these works as are careful and skilled in the various trades. Regular checks of worksites are being done by officers and supervisors during execution of track works to ensure safety and deployment of adequate trained manpower."**

29. When the Committee asked as to what percentage of the track maintenance has been outsourced during the last five years, the Ministry in their written reply stated as under:

> "On Indian Railway network, majority of regular Track Maintenance activities are done by Track machines owned by Railways and operated by permanent staff of Railway. These are supplemented by Railway's Track Maintainers who carry out works of immediate attention, urgent repairs, patrolling and sundry maintenance activities. 20 activities of track maintenance, mainly related to track renewal works, have been outsourced over Zonal Railways. Only limited work of track maintenance is outsourced to make good the deficiency on account of shortage of manpower. As the outsourcing is being done activity wise (which varies over different sections of Railways) and not manpower based, the actual percentage of outsourcing cannot be accurately expressed."

30. On being asked as to how does the railway ensure that the quality has not been compromised with regard to track maintenance by outsourced agencies, the Ministry in their written reply stated as under:

> "The track renewal and maintenance works are to be executed by agencies to fixed stipulated standards in presence of Railway Supervisors/Officers. Railway Permanent way engineers posted at different sections of the division ensure the quality of the work. Outsourcing agencies also deploy graduate/diploma engineers, as per conditions of the contract, for planning, execution and quality control of the works. Different track parameters are regularly checked during

execution of work. Regular test check of worksites is being done by higher officers for any deficiencies before releasing the payment for work."

31. When asked about the difficulties in outsourcing of track maintenance work, the Ministry in their written reply stated as under:

"There are no major difficulties in outsourcing of identified activities. Outsourcing of activities is being done through work contracts based on the quantities of each item involved in scope of work and not as manpower supply contracts. Minor issues as and when arise are addressed by the field officials."

32. On being enquired as to **how does the Ministry ensure the continuous training and skill development of both permanent and outsourced staff and what mechanisms are in place to regularly assess and verify the competence of the deployed workforce in track maintenance,** the Ministry in their written reply stated as under:

"For training of permanent staff, there are well laid down training modules and periodicity for various Permanent way officials for induction as well as refresher courses. Regular training to P. way staff is imparted through various Zonal Training Centre (ZTC) and Divisional Training Centre (DTC). Apart from the regular trainings, training courses for improved technologies to senior supervisors is organized by Supervisors Training Centre under ambit of IRICEN pune. Specialized courses for welders and USFD operators are being arranged through RDSO/Thermit welding training centers. The competency is issued to welders and USFD operators after training with specified validity period. The staff having valid competency certificate is only allowed to undertake these safety critical activities, which automatically ensures that training of such officials is up to date. Similarly, the staff directly involved in safety critical activities such as gateman, trolleymen etc are also issued competency certificates with specified validity period after requisite training and judging the knowledge. Details of training are fed in TMS and exception report is generated, which is being monitored to ensure that the due training is imparted timely. Outsourcing work is awarded to agency who have adequate experience of track maintenance works. Provisions are kept in the contracts for deployment of skilled manpower by agencies for specialized track works. Deployment of trained manpower is ensured by Railway Supervisors. Penal actions as per General Conditions of Contract are imposed on the agency, in case of default. Further, various training/counseling sessions are also being conducted periodically for the outsourced staff by Railway. The outsourcing agencies deploy workers specialized for P.Way works as a result of their long association with such type of works. These workers execute the works under trained Supervisors & Railway Supervisors. Whenever any outsourced person is deployed as patrolman or in gate, training is imparted and only after completion of training, he is allowed to work."

Para No. 2.4: Mechanization of track maintenance activities

33. Audit noticed idling of Track machines on account of blocks not given by the Operating Department (32 per cent), blocks not planned by Divisions (30 per cent), operational problems (19 per cent), non-availability of staff (five per cent) and no scope of work (three per cent). Audit observed that idling of track machines due to 'block not given by the Operating Department' and 'Stabled due to operational problems' was found in all the twelve Zonal Railways; in eleven Zonal Railways, the track machine was kept idle for 13 to 1881 days due to 'non-availability of track machine staff' and the idling of track machines due to 'block not planned by divisions' and 'programme not planned by Track Machine Office' was noticed in ten Zonal Railways.

34. On being asked about the mechanization of track maintenance activities, the Ministry representative submitted during his evidence before the Committee as under:

> "Sir, at present, 1,560 track machines are available with us. I want to inform the Committee that even in track renewal work, we are using track machines. There are apprehensions of hon. Members about the quality of laying of track. We are doing mechanization in the track renewal itself. The quality of the work is ensured by laying the tracks with the help of track machine. For maintenance of machines, we have inducted a good number of machines. So, the maintenance is being carried out with the help of automatic machines which ensures the quality of maintenance."

35. When asked as to how they ascertain the strength of rail tracks, the Ministry representative submitted during his evidence before the Committee as under:

> "Sir, we have got track recording cars. This is a machine which is used for barrage screening. This is one of the very important track maintenance operations that we are doing. The track is laid on stone ballast. With the passage of time, this stone ballast gets polluted due to the earth and dust. It is required to be cleaned periodically so that we can maintain that track."

36. On being asked about the measures taken by the Ministry and the zonal railways to ensure timely preparation of plan and notify block hours well in advance by the operating departments to facilitate timely track maintenance, the Ministry in their written reply stated as under:

> "There is a concept of corridor block which is inbuilt in the working time table issued by Zonal Railways. Further, to streamline the implementation, the rolling block concept with 2 weeks advance planning has been enforced, which is reviewed every week by the Divisions and Zonal Railways."

37. When asked as to what action has been taken by the Indian Railways on the recommendations of the National Academy of Indian Railway, Vadodara on optimum utilization of track machines, the Ministry in their written reply stated as under:

"The recommendations of the National Academy of Indian Railway, Vadodara on optimum utilization of track machines issued in May 2017 are being implemented. The action taken is as follows:

(i) *The RB needs to ensure that the distribution of track machines shall be made after judicious assessment of the requirement of the ZRs so as to avoid holding of track machines in excess of requirements.*

Action taken: Based on the recommendation of NAIR/provision in Track machine manual, the requirement of Track machine has been worked out zone wise based on workload.

(ii) *Quality of maintenance of track machines shall be the focus areas.*

Action taken: To improve the reliability and quality of track machines, 2 additional periodic overhauling workshops (Vatva near Ahmadabad and Kachrapara near Howrah), besides the existing 2 (Prayagraj and Secunderabad), have been developed and made functional. Besides this, Zonal Track machine maintenance depots have also been set up at strategic locations. Satellite Track Machine Maintenance Depots (STMMD) are being set up in each division to ensure timely maintenance of machines with improved quality.

(iii) *Pre/post block preparations shall be done properly and in advance to avoid loss of working time of machine during block.*

Action taken: This is a pre-requisite for effective machine utilization. Accordingly, the instructions have been reiterated to Zonal Railways."

(iv) *Action shall be taken on priority to fill-up vacancies in supervisory and track machine staff.*

Action taken: There has been increase in track machine staff from 2017-18 onwards.

(v) *To avoid breakdown time of machines, sufficient inventory of spares shall be maintained in depots.*

"Instructions for ensuring sufficient inventory of spares in depots have been reiterated"

(vi) *Track machine staff shall be given stipulated trainings.*

Action taken: Track machine staff are trained regularly at Indian Railway Track Machine Training Centre (IRTMTC). Besides Railway instructors, Experts of Original Equipment manufacturer (OEM) are also engaged in this training. In support with OEM, track machine simulator is also established at IRTMTC for learning the operation of tamping machines."

38. When asked as to what actions are proposed by Railway Administration to ensure optimum utilization of Track Machines for maintenance activities, the Ministry in their written reply stated as under:

"i. Induction of High Output Integrated machines on IR.

ii. Advance planning of two weeks Rolling Block Plan at Division level and critical review of implementation at Division and Headquarter level.

iii. Augmentation of two new Central Periodic Overhauling Workshop (CPOH), one each in Eastern & Western region, in addition to the two existing in Northern & Southern regions, for machine maintenance & upkeep of machine health in good fettle to get quality output.

iv. Satellite Track Machine Maintenance Depots (STMMD) are being set up in each division to ensure timely maintenance of machines and improved quality."

39. When enquired as to whether sufficient fund had been allotted for mechanization of track maintenance activities and the details of fund allotted and utilized for the purpose during the last 5 years, the Ministry in their written reply stated as under:

"Sufficient fund had been allotted for procurement of track machines utilized for mechanization of track maintenance activities. Details of fund allotted and utilized for the procurement of track machines during the last 5 years is given below:

Year	Initial Fund allotted (Rs. In Cr.)	Actual Expenditure/ Final Grant (Rs. In Cr.)
2017-18	410.07	665.00
2018-19	736.66	875.00
2019-20	476.34	1000.00
2020-21	1394.67	1766.15
2021-22	2284.24	2548.70
2022-23	3150.39	2683.42

Expenditure on track maintenance activities is incurred under Sub-Major Head 02-Repair and Maintenance of Permanent Way & Works under Major Head 3002-3003 in Revenue Grant. Apart from this, expenditure is also incurred under Minor Head 31-Track Renewal under Major Head 5002-03 in Capital Grant. There has been no shortage of funds for track maintenance activities. Funds utilized for the purpose during the last five years is shown in the following table –

(Rs in cr)

Year	**Revenue**	**Capital**
2018-19	14788	9690
2019-20	16067	9391
2020-21	15993	13523
2021-22	16593	16558
2022-23 (Prov.)	18119	16325

40. On being asked about the percentage of mechanization in track maintenance work and the steps initiated/contemplated to minimize human intervention in Railway's operational aspects and maintenance, the Ministry in their written reply stated as under:

> "Percentage of mechanization in track maintenance work as of 31.10.2023 is detailed as under: (i) 81.9% for Deep Screening of plain track. (ii) 74.3% for Deep Screening of Turnouts. (iii) 70.6% for Plain Track Renewal (TSR) (iv) 28.6% for Turnout Renewal. The steps which have been initiated/contemplated to minimize human intervention in Railway's operational aspects and maintenance are: (i) Instructions have been issued for carrying out track renewal and maintenance activities through complete mechanization by 2024 (ii) More and more track machines are being introduced for mechanized track maintenance."

Para No.2.5: Introduction of wider and heavier pre-stressed concrete sleepers

41. Audit noticed that Research Design and Standard Organization (RDSO) had developed a new wider and heavier pre-stressed concrete sleeper (RT-8527) for Indian Railways to keep pace with the increased freight traffic by allowing higher axel load on existing track. Accordingly, Railway Board had issued directives on use of RT-8527 sleepers from 2019-20 onwards. However, audit found that RT-8527 sleepers, in sanctioned patches above two kilometre length from 2019-20 onwards, has not been used by some zonal railways at the time of track renewal due to non-availability of the rate reference in Indian Railways Projects Sanctions and Management (IRPSM), web based application, for RT-8527 sleepers at the time of preparation of detailed estimates.

42. When enquired about the usage of wider and heavier pre-stressed concrete sleepers, the Ministry official replied during submission before the Committee as under:

> "The normal wide based 60 kg PSC sleepers with elastic fastening on plain track and PSC sleepers on turnout are used while carrying out primary track renewal. Almost 98 per cent of PSC sleeper on the plain track is now concrete PSC sleeper and, similarly, on the turnout also, almost 98 per cent sleepers are PSC sleepers. We were earlier using the wooden sleepers on bridges. Old wooden sleepers on bridges are being replaced with steel channel or H Beam sleepers while carrying out the primary track renewal work. The cumulative number of steel channel or H Beam sleepers has increased to around ten lakhs. During further evidence, the Ministry official stated that the progress during current financial year up to October, 2023, is almost 63,000 and that takes the total to 10.6 lakhs."

43. The Ministry in their written reply on the same issue stated as under:

> "Key advancement in the technology takes time, as it involves change in mould, design, fittings (rubber pads, liners), arrangement for fittings for transition period etc. There are three main reasons for which utilization of the wider and heavier pre-stressed concrete sleepers (RT-8527) in Zonal Railways could not pick up as detailed below:-

1. The existing stock of normal sleeper (RT-2496) and its matching fittings were required to be utilized by the Zonal Railways to avoid wastage of resources.

2. Initially, the matching fittings of wider sleeper (RT-8527) were not available with Zonal Railways. Hence, few Zonal Railways produced normal sleepers (RT-2496) to continue critical track renewal and construction works.

3. The wider sleeper (RT-8527) was not designed to accommodate 52 kg rails, hence Zonal Railways kept on producing normal sleepers (RT-2496) for requirement of 52 kg rail routes.

Utilization of the wider and heavier pre-stressed concrete sleepers (RT-8527) has now picked up. The production of RT-8527 has increased from zero in 2017-18 to ninety five lakh five thousand nine hundred and fifty eight whereas the production of normal sleepers has declined from ninety four lakh fifty six thousand four hundred ninety six to five lakh eighteen thousand two hundred seventy six."

44. On being enquired as to whether necessary changes have now been made in the Indian Railways Projects Sanctions and Management (IRPSM) application, the Ministry in their written reply stated as below:

"Yes, necessary changes for incorporation of rates of wider sleepers have been made in IRPSM by concerned Zonal Railways. Further utilization of the wider and heavier pre-stressed concrete sleepers (RT-8527) has now picked up."

45. On being asked about the measures taken by the Ministry and concerned Zonal Railways to remedy the error and the action taken against the officials responsible for non- adherence to the Board directives, the Ministry in their written reply stated as below:

"Railway Board vide letter dt. 17.10.2018 has communicated the approval of Railway Board to all Zonal Railways regarding use of wider and heavier sleeper (RT-8527) from financial year 2019-20 onwards. Tender for procurement of wider sleepers (RT-8527) was finalized by Board in May'2019 with provision of mobilization period of 4 months for shifting to production of wider sleepers. Accordingly, Zonal Railways started production of wider sleepers from September 2019 onwards. Zonal Railways have started using wider sleeper RT-8527 based on availability of wider sleepers & its matching fittings. Zonal Railways also kept on using normal sleepers (RT2496) till stock of normal sleepers and matching fittings were available, so as to avoid wastage of resources. Further, wider sleeper (RT-8527) were not designed for 52 kg rail, hence Zonal Railways were compelled to use normal sleeper (RT-2496) only for 52 kg rail category, which have got sufficient residual life. In view of above systemic issue, no individual was considered responsible for time taken in

switching over to new technology. Accordingly, there was no necessity to take any punitive action against officials."

46. On being asked whether any financial constraint has been experienced in the process of such replacements, the Ministry in a written reply stated as under:

> "No financial constraints were experienced in the usage of wider sleepers (RT-8527) as provisions for sufficient funds were made available in concerned plan heads."

Para No.2.6: Alumino Thermit and Flash Butt Welding

The rail joint is an important part of the track system. Alumino Thermit (AT) welding and Flash Butt (FB) welding processes are used for welding of rail joints in the Indian railways. The preferred process of FB welding involves an automated tracklaying machine running strong electrical current through touching ends of two un-joined pieces of rail to form a strong weld. The Corporate Safety Plan of IR (2003-13) emphasized that as the AT welds are weak links in track, it would be gradually reduced and replaced by FB welds. Audit noticed that while the targets in respect of the less preferred AT welding (manual process) were achieved, there was shortfall in achievement of targets for the preferred FB welding. In reply concerned zonal Railways have listed reasons like unavoidability of use of AT welds for regular maintenance, *use of AT welding where FB welding is not economical*, non-fixation of targets for removal of AT welds and isolated welding as reasons for opting the less preferred AT welding. In reply to the recommendation of the Standing Committee on Railways, the Ministry had stated that technology upgradation in laying and maintenance of track is being carried out continuously, switching over to mobile FB welding technology in place of AT welding to carry out weld renewals.

47. On being enquired about the steps being taken to encourage all Zonal Railways to adopt the preferred FB welding process, the Ministry representative replied during his submission before the Committee as under:

> "The Indian railways are reducing the population of alumino thermit belt gradually by using the longer rail panel of 123 flash butt belt from rail manufacturing plants. These flash butt belts are of higher quality with least chance of internal defect and they improve safety. The percentage of long rail supply to Indian railway has increased to almost 83 per cent of the total supply in the year 2022-23. Sir, I would just like to explain here that in the past, the rails that we were procuring from SAIL, they were of the order of 13 metre long or 26 metre long or 39 metre long etc. These rails when laid in the track, they were welded by what is called alumino thermit welding. But the alumino thermit welding is not as strong as the original rails. So, we have been constantly making several efforts to reduce the population of alumino thermit belts in the track. One of the measures taken is that we are procuring longer rails directly from the steel plants. Currently, we are procuring 260 metre long rails which are transported in special rakes from the steel plans and directly unloaded at the site where the renewal work is to be carried out. These rails also are directly rolled in 130 metre or so of length and have got maximum one, two or three flash butt welded joints. A flash butt welded

joint is a superior joint which is as good as the quality of parent rail. This has substantially helped us in reducing the breakage of rails, what we call, 'weld failure during service', which is also a hazard for safety. Sir, on most of the busy tracks, short-welded rails of 39 metre length and single rail have been converted into the long-welded rail. As on 31st March, 2023, 88.55 per cent of busy track is long-welded rail. Shortwelded rail of 39 metre length and single rail are limited to the location where longwelded rails are not permitted on technical ground. "

48. In reply to the same question, the Ministry in their written reply stated as under:

"The Road Map for reduction of AT Welding on Indian Railways (IR) had been prepared in 2019 and being followed by IR since then. Accordingly, following steps have been taken to adopt the preferred FB welding and minimize AT welding: -

1. For all New Line/Gauge conversion/Doubling Projects, initial track laying is being done by using Second hand service rails. These service rails are being replaced by Long rail panels of 260m with one/two/three Flash Butt weld (FB) supplied from rail manufacturing plant. As maximum proportion in the form of long rails is being supplied to the field, therefore, number of AT welds requirement is reducing.
2. In all New Line/Gauge conversion/Doubling Projects, FB Welding by Mobile FB plant is being used to convert 260m rail panels into continuous welded rails.
3. Rails of different lengths are being used by cutting long rail panels for use in Points and Crossings (P&C) area, so as to reduce AT Welding.
4. For loop lines and sidings, FB welding by Mobile Plants is being used for welding.
5. Older AT welds are being replaced with FB welds through weld renewal works with Mobile Flash Butt Plant. However, AT welding is inevitable for certain locations like attention to rail/weld failures, isolated SEJ renewals, point and crossing approaches, glued joints etc."

49. When the Committee desired to know whether all weld renewal work in the railway track is being done through FB welding method now, the Ministry in their written reply stated as under:

"Through AT welds renewal works are being done with FB welds with Mobile Flash Butt Plant. However, at certain isolated locations such as attention to rail/weld failures, isolated SEJ renewals, point and crossing approaches, glued joints etc., AT welding is being done, where mobile FB is not practical."

50. When enquired as to what measures have been taken by the Ministry and Zonal Railways to provide sufficient FB welding machinery and equipments for railway track maintenance staff, the Ministry in their written reply stated as under:

"IR has achieved supply of 83% of total rails in the form of long rails in FY 22-23 and targeting for 90% of its total requirement in the form of long rails in FY 24-25 from manufacturing plant with one/two/three Flash Butt weld. IR has also

upgraded its Stationary Flash butt plants. Sufficient numbers of Mobile Flash Butt Welding Plants (121 nos.) of various agencies, have been approved so far for carrying out in-situ FB welding works on IR."

51. When asked about the present timeline for completion of replacement of AT welds with FB welds and whether there is any mechanism to oversee and ensure the objective of 100 % replacement, the Ministry in their written reply stated as under:

"100% replacement of AT welds with Flash Butt welds is not practically possible as AT welding has to be done for certain isolated locations such as for attention to rail/weld failures, removal of USFD defects, Scabbed rails, isolated SEJ renewals, point and crossing approaches, glued joints etc. Road Map for reduction of AT Welding on Indian Railways (IR) had been prepared in 2019 and is being followed by IR. Accordingly, older AT welds are being replaced with FB welds by through weld renewal using Mobile Flash Butt Plants. Technology upgradation in laying and maintenance of track is being carried out continuously, switching over to FB welding in place of AT welding. All efforts are being made to reduce AT welds & to provide FB welds. As such, there is no time line for replacement of existing AT welds with FB welds."

52. When the Committee asked whether the use of AT weld is relevant in view of availability of better technology in the form of FB weld and use world class standards of the AT welds is done, the Ministry in their written reply stated as under:

"IR has adopted to use long rail panels to reduce population of welds. IR has achieved supply of 83% of total rails in the form of long rails in FY 22-23 and is targeting for 90% in FY 24-25. IR is planning to increase long rails to 95% of its total requirement by FY 26-27. So, use of AT weld will be reduced considerably by FY 26-27. Though, FB Welding is better technology, however, certain minimum quantity of AT Welding needs to be done where mobile FB is not practicable. IR is using world class standards for AT welds. IR specification for AT welding (IRST-19-2021) is at par with European code for AT welding (BSEN 14730-1: 2017) and in some cases more stringent than European Code."

Para No.2.7: Ultrasonic Flaw Detection Testing (USFD)

53. The USFD testing was to be carried out at the prescribed frequency. There was shortfall in USFD testing. Timely testing by USFD may help in early detection of vulnerable points and initiating necessary remedial measures to reduce the probability of accidents. Audit observed that there were shortfalls in USFD testing in rails and welds during 2017-2021); in Northern Railway, in respect of USFD testing in rails, there was shortfall of 50 per cent; in North West Railway, the shortfall was 11 per cent and in South West Railway, the shortfall ranged between 4-41 per cent and in South East Railway, the shortfall in USFD testing on welds ranged between 04 and 42 per cent. In Western Railway, the shortfall ranged between 10-37 per cent. In North Frontier

Railway, the shortfall ranged from 4-23 per cent and in East Coast Railway, the shortfall was up to 100 per cent.

54. When asked about the usage of USFD, the Ministry representative replied during evidence before the Committee as under:

> "Sir, ultrasonic flaw detection system is used in Indian Railways in detection of flaws in railways to enable timely removal of defects. This has increased over the years. Now, we are doing the USFD testing in the range of 305 thousand track kilometer per year. Similarly, USFD testing is being done for weld and the number has increased to 2533 thousands welds per year. Sir, this is a very important activity for safety. The Committee would recall that there have been instances in the past when derailments have taken place because of rail breakage. So, ultrasonic testing of welds helps in detecting any flaw which is developing in the rail or in the weld. So, we have laid lot of emphasis in improving the ultrasonic testing of rails."

55. On being enquired as to what actions have been taken to ensure adherence to frequencies of Ultrasonic Flaw Detection Testing (USFD) of rails and welds, the Ministry in their written reply stated as under:

> "Indian Railway has a set system of testing of rails and welds by Ultrasonic Flaw Detection Testing (USFD) machines at prescribed frequencies. These testing are being monitored at field, division and Zonal Railways regularly. Indian Railway has already adopted a web enabled Track Management System (TMS) to ensure monitoring of the track inspection and maintenance activities at various levels of Railway working. Alarm/Reminder is provided by TMS for any locations of rails & welds due for USFD testing, based on which planning and deployment of USFD testing team is done efficiently. 641 number of departmental USFD machines for Rail testing and 620 number of departmental USFD machines for Weld testing are available to ensure adherence of testing at prescribed frequencies. Further, new USFD machines in lieu of old Machines whichever complete their codal life and for additional work load due to change in GMT/additional line, are being procured. 282 number of USFD machines for Rail testing and 258 number of USFD machines for Weld testing have been procured in the last three years."

56. On being further asked about the efforts being made to ensure availability of sufficient equipments and manpower for undertaking adequate USFD and difficulties being faced in undertaking USFD, the Ministry in their written reply stated as under:

> "Requirement of resources is reviewed annually based on traffic density and addition of railway network. 641 number of departmental USFD machines for Rail testing, 620 number of departmental USFD machines for Weld testing and manpower, commensurate with workload, are available on IR. Outsourcing agencies are made available over and above the departmental workforce to meet the shortfall over and above the departmental resources. Generally, no major difficulties are being faced in undertaking USFD."

57. When asked about the allocation made and utilized by the Indian Railways for carrying out USFD testing in the last five years and whether funds available have been sufficient for the purpose, the Ministry in their written reply stated as under:

> "The cost of USFD testing is being charged to revenue and track renewal works. No separate allocation is made for USFD testing. However, approximate expenditure incurred for procurement of USFD machines, consumables, outsourcing etc is Rs. 358 Crores in the last five years on Indian Railway. There is no problem of funds for carrying out USFD testing."

58. On being asked by the Committee about the status of induction of self-propelled ultrasonic Rail testing car by the Indian Railways, the Ministry informed that tenders for 19 SPURT Cars have already been opened and are under finalization and the details in this respect will be furnished to the Committee in writing.

Para No. 2.9: Maintenance of 'Yard Lines'

59. Audit was of the opinion that shortfalls in maintenance activities may lead to unsafe track, adversely affecting the safe movement of trains. As against the demand of 7339:28 hours for Yard line maintenance, only 4667:56 maintenance block hours were granted by the Zonal Railways during 2017-2021. The reasons for the shortfalls were attributed to (i) the agencies not turning up to execute the work in time, (ii) less block granted against those demanded and (iii) non-availability of material, etc. Because of shortfalls in maintenance activities, the conditions of track would become unsafe, adversely affecting the safe movement of trains.

60. When asked about steps taken to ensure that agencies responsible for carrying out track maintenance activities execute the work in a timely manner, the Ministry in their written reply stated as under:

> "Execution of works in yard lines sometimes suffers due to stabling of goods trains on loop line for operating requirement, frequent movement of trains in yard affecting availability of block, lack of working space etc. However, since the speed of operation on loop line is always less (up to 30 kmph), the block granted is adequate for required maintenance effort. For timely execution of works, conditions are kept in the contract agreement for execution of all items in the scope of work. Works are executed by the outsourcing agency based on detailed planning for supply of men and machinery etc required for the work. Regular monitoring of progress is being done by Railway officials linked with the execution of works. Action in terms of conditions of contract is taken in case of delay on contractor's account."

61. On being asked about the actions taken against those agencies who have not turned up to execute the assigned work in time, the Ministry in their written reply stated as under:

> "Some of the operational reasons for non turning up of agency for assigned work in time, is due to the uncertainty in clearing of occupied line from stabled goods trains and loss of labour involved due to frequent occupation of lines for operating

reasons like precedence, stabling etc. However, in case of contractual default, Penal provisions exist in Maintenance and renewal contracts for non-execution of works by the agencies. Accordingly, actions *viz.* imposition of penalty, termination of contract etc. are taken against the defaulting agency."

62. On being enquired about the present ratio of grant/utilization of maintenance blocks against the blocks demanded by Zonal Railways, the Ministry in their written reply stated as under:

> "The blocks granted were fully utilized as per planning. Though, the %age block availability is less in 2022-23 w.r.t. 2021-22, it may be noted that there is 23% increase in absolute block hours demanded & 17% increase in absolute block hours granted in 2022-23 w.r.t. 2021-22. It may also be appreciated that the block granted in terms of percentage remains around this limit only due to various operational reasons."

63. On being asked as to how does Railway Administration plan to bridge the gap between blocks demanded and that granted for important maintenance activities, the Ministry in their written reply stated as under:

> "There is a concept of corridor block which is inbuilt in the working time table issued by Zonal Railways. Further, Joint Procedure Orders (JPOs) from the Engg. & Traffic Dte. have been issued to Railways for advance planning of traffic blocks for maintenance of assets. Recently, system of Rolling Block Plan (RBP) have been introduced at Divisional level for advance two week block planning for maintenance of assets by different departments working in same block to avail maximum benefits of traffic blocks, which is reviewed every week by the Divisions and Zonal Railways."

Para No. 2.11: Inspections by Higher Authorities

64. Regular inspections by higher officials, may lead to enhanced overall safety in the operations of the trains. Audit observed differences in the ratio of route kilometer with average number of inspections. In two Zonal Railways, the ratio was more than 2400 km for one inspection. For seven Zonal Railways, the ratio was more than 220 km for one inspection, and the ratio ranged from 223 to 674. In three ZRs, the ratio was 141, 123 and 14 respectively. In South East Central Railway, higher officials did not carry out any inspection, though the zone has 2348 route km (around 4 per cent of total of Indian Railways) Broad Gauge line. As no standard criterion was set for number of inspections to be conducted by higher authorities, there is no accountability for meagre number of inspections.

65. When asked as to how the Ministry and the concerned Zonal Railways ensure that regular and thorough inspections are being carried out by the higher officials, the Ministry representative replied during submission before the Committee as under:

> "Firstly, our complete system of operation and maintenance of the railway infrastructure and operation is at the level of Railway Division. The officers and the staff, who are posted in the Railway Division –the officers and the supervisors

– carry out the operation and maintenance. For them, we have got the laid down schedules for carrying out the inspections. For a Senior Section Engineer, who has got a particular section under his charge, there is a schedule laid down for carrying out inspection. Above them, there is an Assistant Engineer who has got a schedule for carrying out various types of inspections for various assets. Above him, there is a Senior Divisional Engineer, who is the highest officer of the technical department at the Division level. For him also, a schedule is laid down for carrying out the inspection. I think, what Audit has pointed out is inspection by the headquarters' officers and said that there is no laid down schedule for the senior officers. In this regard, the role of the officers posted in the Zonal Headquarter is not day-to-day operation and maintenance. Their job is to provide resources in terms of Budget sanctions to the requirement of the Divisions, to provide them technical drawings and specifications, and to provide them instructions, circulars etc. on the working. However, the officers of the headquarters also periodically go to the Divisions and carry out random inspections to see how the instructions of the headquarters as well as provisions of manuals etc. are being implemented in the field. So, there is no requirement or as such system of laying down a periodicity of inspection of officers who are posted in zonal headquarters. For the divisional officers, we do have the system."

66. When further asked by the Committee about the annual inspection, the Ministry representative replied as under:

"Sir, there is a system of annual inspection by the General Manager in which one section of every Division is selected every year for a thorough inspection by all the concerned principal heads of the department. From the zonal headquarter they go to a particular section and then they carry out a thorough inspection of each and every aspect during this inspection. They see whether the laid down provisions of the manuals and the instructions given by the headquarter and the required safety works are being properly carried out in the Division. Based on that review, the Divisions are advised whatever corrective actions are to be taken."

67. In reply to a further query by the Committee about the range of inspections, the Ministry representative replied as under:

"Sir, I will just request you to see the third and fourth paras of this particular para 2.11. It says: "Audit observed that though periodical or special inspections such as that of territorial head of the department, the Chief Engineer, etc., have been mentioned in the IRPWM, no target in terms of inspections to be conducted by the higher officials has been fixed by IR. Audit also observed that there was wide variation in the number of inspections conducted over various zonal railway by the higher officials." So, Sir, this particular para where Audit has mentioned about this, they have talked about the inspection by officers of the zonal headquarter. This is what I was trying to explain. I also want to supplement that we have a system which is called Track Management System which is used for monitoring entire inspection of track. Now, it is mandatory for all the divisional supervisors and officers to upload their inspections in the Track Management System. It is a

very comprehensive system where complete online tracking of the inspections and maintenance is carried out. However, the same thing is not being done regularly at the headquarter level. If we refer to the data of the TMS, we will not find the complete details of inspections done by headquarter officers on the TMS. So, that gap is also there."

68. When enquired about the role being played by the Chief Commissioner of Railway, Safety insofar as inspection is concerned, the Ministry representative replied as under:

"Sir, CCRS will supplement whatever I am saying. I will give you the first information. The Commission of Railway, Safety role is whenever we are commissioning a new asset which may be a new line, or doubling a line, or a gauge conversion project, before opening any new asset, a thorough inspection is carried out by the Commission of Railway Safety. Besides, whenever we are doing a major modification to our assets, like altering a yard, or doing an alteration to the signaling system of a station, such things also require sanction of the Commission of Railway Safety. I will request CCRS to supplement what I have said."

69. In response to the same question, the CCRS supplemented by stating as under:

"The Commission of Railway Safety works under the administrative control of the Ministry of Civil Aviation and dealing with the matters pertaining to the safety of rail travel and train operations and is charged with certain statutory functions as laid down in the Railway Act, 1989. These functions are inspectorial, investigatory, and advisory in nature. The Commission functions according to certain rules framed under the Railway Act. The functions of Commission of Railway Safety are: authorization for the opening of new railway lines which also include gauge conversion and doubling of existing railway lines; sanction for the execution of minor works which includes additional major bridges and remodeling of yards; introduction of new rolling stock and increase in the speed of existing rolling stock; condonation of infringement to the Schedule of Dimensions; and investigation into serious railway accidents. When I say serious railway accidents, it means whenever there is a casualty or there is a serious grievous injury or there is damage to the property worth more than Rs. 2 crore. These are treated as serious railway accidents. A dedicated safety department operates as an internal auditor in the Railways at three tiers: Railway Board level; Zonal Railway level; and the Divisional level. During the period from 2017-18 to 2022-23, a total of 292 accidents have taken place on Indian Railways. The Commission of Railway Safety has inquired 32 cases. That is something around 11 per cent. It pertains to serious accidents happened."

70. On being further asked by the Committee as to whether it only depends upon the loss of property worth Rs. 2 crore or also upon the number of deaths, the CCRS replied as under:

"No, Sir. Even if there is one death or there is a grievous injury, the CRS has to carry out the inquiry. It is mandatory to have inquiry. If there is no death but

property loss is more than Rs. 2 crore, then also it has to be done. Other accidents are inquired by the Railways. In the 32 accidents which are inquired by the Commission of Railway Safety, we have given around 302 recommendations and the Action Taken Report from the Railways have been received for 23 inquiries which is around 72 per cent. Two inquiry reports have been submitted recently in the month of April and June. In the last few years, there has been a considerable improvement in the compliance of ATRs. As of now, only seven ATRs are pending. As regards recommendations, in the 23 inquiry reports which we have submitted, 92 per cent recommendations have been accepted, balance 18 recommendations are under consideration of the Railways. As of now, nil report is pending in the Commission for the inquiry. We do not have any pending inquiry to be carried out by the Commission."

71. When pointed out by the Committee about the activities of the Commission of Railway Safety and the reason for drastic decline in the number of periodical inspections during 2017-18 to 15,565 and now reduced to 5,145, the Ministry representative replied as under:

"Sir, those periodical inspections are by our Operation and Maintenance officials. Those are not by CRS."

72. In reply to the question by the Committee regarding regular and thorough inspections being carried out by the higher officials, the Ministry in their written reply stated as under:

"Detailed schedule of inspection of field officials (JE/SSE/ADEN) have been stipulated in IRPWM and in addition, the guidelines for inspection by Divisional officers have been issued by Railway Board. Monitoring of inspection is done by the senior officers at Divisional and Head quarter level during their inspection. Higher officers in Headquarter are normally entrusted with duties of arranging sanction, funds, approved drawings and guidelines etc. As such, no inspection schedule is stipulated for them. However, Headquarter officers carry out the technical inspections suo motu and also during the safety drives launched from time to time, which are scrutinized on completion of such safety drives. Safety inspections are carried out by Railway officers over and above the large numbers of inspection of assets and operations that are carried out by Railway officers during their regular course of work, which include many aspects directly related to safety in train operations. During these safety inspections, officials, including senior officers, intensively inspect different areas of Railway working in the field."

73. When asked whether the Track Management System (TMS) provides for real time notification of deficiencies during such inspections, the Ministry in their written reply stated as under:

"Inspections of higher authorities are accompanied by field officials responsible for attending the deficiencies observed during the inspection. The Deficiencies are noted then and there by the field officials and necessary attention is given. After attending, the compliance is reported to higher officials, who monitor the same."

74. On being asked whether standard criteria have been set for conducting regular inspections in all the Zonal Railways by higher officials and the details including the number of Kilometers to be inspected over a fixed period of time and other parameters/criteria of inspection, the Ministry in their written reply stated as under:

> "Detailed schedules of inspection of field officials (JE/SSE/ADEN) have been stipulated in IRPWM and in addition, the guidelines for inspection by Divisional officers have been issued by Railway Board. The type of inspection and the frequency has been stipulated for each official. The inspection of track involves inspection of various track features viz. turnouts, SEJ, Level crossing, track on bridges, etc apart from the trolley inspection. As such, the kms of inspection is not true representation of the inspections done by higher officials. The monitoring is accordingly done with respect to inspection of various track features. For safety inspections, Indian Railways has not specified criteria of number of kilometers to be inspected per inspection by higher officials (HQ Officers). There are multiple kinds of safety inspections. The inspecting officers are usually directed to do footplate inspections of a given section, inspect a given station, yard or station, or look for certain particular occurrences, faults or issues over a given stretch in special drives. Care is taken to ensure that all relevant assets and operations are inspected regularly. At the same time certain critical areas in terms of assets and operations are inspected more intensively than others."

Para No.2.13: Training of track maintenance officials

75. Audit noticed that 794 officials dealing with track maintenance activities were not given training in seven ZRs. Induction/initial training was not given to 240 officials and refresher training was not imparted to 518 officials of the different ZRs. Shortfall in imparting training to 'Track Maintenance officials' either at their induction level or at refresher course level had been reported by seven divisions; and shortfalls in trainings at supervisory level, such as, SSE/JE/P. Way were also seen in two Divisions. The reasons for the shortfall in imparting training at various levels were mainly attributed to Covid-19 situation, staff not being spared due to special work and other assignments, non-receipt of training schedule in the units and non-updating of information of employees in Track Management System (TMS), etc.

76. In their background note, the Ministry have replied as under:

> "*All safety category railway employees are given structured training at various stages of their career.
>
> *Simulator- based training is being imparted for improving the driving skills and reaction time of Loco Pilots.
>
> *Training module has been formulated for running staff on Fire Fighting & use of fire extinguishers.
>
> *There is regular counseling of running staff and interaction with their families.

*It has been the constant endeavor of Railways to develop Human Resources. During the year 2022-23, around 5,00,833 non-gazetted employees were given different types of training viz. initial, promotional, refresher & specialized."

77. When asked as to how the Ministry and Zonal Railways ensure that all track maintenance officials are adequately trained and are qualified to handle the work, the Ministry in their written reply stated as under:

"There are well laid down training modules and periodicity for various P. way officials for induction as well as refresher courses. Revised Training Modules of non Gazetted staff of Civil Engineering Department have already been issued Regular training to P. way staff through various Zonal Training Centre (ZTC) and Divisional Training Centre (DTC). Apart from the regular trainings, training courses for improved technologies to senior supervisors is organized by Supervisors Training Centre under ambit of IRICEN Pune. Specialized courses for welders and USFD operators are being arranged through RDSO/Thermit welding training centres. The competency is issued to welders and USFD operators after training with specified validity period. The staff having valid competency certificate is only allowed to undertake these safety critical activities, which automatically ensures that training of such officials is up to date. Similarly, the staff directly involved in safety critical activities such as gateman, trolley men etc are also issued competency certificates with specified validity period after requisite training and judging the knowledge. Details of training are fed in TMS and exception report is generated, which is being monitored to ensure that the due training is imparted timely."

78. On being asked the details of whether periodic refresher courses and training are conducted to impart/enhance the technical knowledge of the officials, the Ministry in their written reply stated as under:

"To achieve the target of safe and customer centric train operation, the role of training is considered very essential. A comprehensive and robust system of training has been developed in Railways. There is whole range of Training Courses viz. Initial Courses, Promotional Course, Refresher Course, Specialized Course etc. conducted for various categories of Safety and Non-Safety Staff. To upgrade the skill and technical knowledge of the staff and to keep them abreast with introduction of new technologies from time to time, periodic refresher courses are conducted for various categories of Safety and Non-Safety Staff. It is mandatory especially for Safety Categories of Staff to undergo periodic refresher courses."

79. Replying on the same subject, the Ministry representative stated as under:

"We provide initial training. After that, periodically, regular training is being imparted, which we call as refresher course, and in the refresher course, all the important instructions are repeated or reiterated to them so that their knowledge is refreshed. Besides that, we are also conducting promotional courses. When any employee is promoted and he is given a higher responsibility, we are

conducting promotional courses. We also conduct special courses which are targeted. Whenever we identify a particular area of railway working which requires more training, then we are giving specialized training courses. So, these are the four categories of courses which we are imparting to our employees. We have constantly laid emphasis on more and more training. So, while in 2010-11, the number of employees trained per year was of the order of three lakhs in a year, this has now been increased to five lakhs employees trained per year to intensify the training being imparted to the employees. The second thing, which one of the hon. Members pointed out, was regarding the training of loco pilots. So, for that purpose, we have got simulators. So, we have installed simulators, and the loco pilots are sent on simulator. A simulator simulates the condition of a train operation, and the loco pilot is trained on that simulator so that before he actually goes on the train, he is trained on a simulator. They are also trained on practices like what is right and what is wrong in train operation. Also, we are imparting training to our onboard staff regarding firefighting and use of fire extinguishers so that in the case of an event of fire, they can immediately respond in the situation and provide the golden hour reaction to the fire situation. Also, stress is an important factor in railway operation because the staff members are continuously concentrating on operation. So, we are also imparting training in yoga and meditation to our employees so that their mental well-being is improved. This is about the important aspect of training that we are imparting."

Accidents/Derailments in Indian Railways (Para 3.1&3.2)

80. Audit revealed 23 factors responsible for derailments in the selected 1129 cases/accidents over 16 ZRs. The factors causing maximum derailments (395) were in 'Engineering Department' followed by 'Operating Department' (173). Out of 23 factors, the major factor responsible for derailment was related to 'maintenance of track' (167 cases), followed by 'deviation of track parameters beyond permissible limits' (149 cases) and 'bad driving/over speeding' (144 cases). From the review of the derailment cases, the cascading factors of series of failures have been identified which includes (i) Rules and Joint Procedure Orders (JPOs), (ii) Training/Counseling of staff, (iii) Supervision of operations, (iv) Coordination and communication between staff of different departments and (v) Scheduled Inspections, in the IR System.

81. The Ministry in their background note replied as under:

"Measures taken to reduce derailments:

Track Renewal and Maintenance: During the year 2022-23, 5,227 kms of track renewal in Complete Track Renewal (CTR) units was carried out.

Track Upgradation: Upgradation to modern track structure, consisting of 60kg, 90 Ultimate Tensile Strength (UTS) rails, Pre-stressed Concrete Sleeper (PSC), is being done (As on 31.03.2023, 65.63% BG Track have been completed in this regard). Normal/Wide base sleepers with elastic fastening, fan-shaped layout turnout on PSC sleepers, Steel Channel/H-beam Sleepers on girder bridges are used while carrying out primary track renewals.

Welded Rails: On most of BG tracks, Short-welded rails of 39m length and single rails have been converted into long welded rails (As on 31.03.2023, 89.63% BG Track is LWR). Short-welded rails of 39m length and single rails are limited to locations, where welded rails are not permitted on technical grounds.

Indian Railways is reducing population of Alumino-Thermit (AT) welds gradually by using longer rail panels with one/two/three Flash Butt weld (FB) from rail manufacturing plant. The percentage of Long Rail supply to IR has increased from 21% during 2015-16 to 83% of the total supply in 2022-23.

Track Recording: Supercheck of track parameters is done through regular runs of Track Recording Cars (TRC). Two additional TRCs have been added to the earlier fleet of 5 TRCs and one is under commissioning.

Regular bridge inspection is carried out for determining the health of bridges .

Repair/strengthening/rehabilitation/rebuilding of Railway bridges is undertaken whenever so warranted by their physical condition. (There are 711 Important Bridges, 12,610 Major Bridges & 14,473 Minor Bridges).

Measures taken to avoid collisions:

Advanced Signaling System - Panel Interlocking/Route Relay Interlocking/Electronic Interlocking (PI/RRI/EI) along with Multiple Aspect Colour Light Signals has been provided at 6,396 Stations out of 6,506 Stations on BG Routes, upto 31.03.2023.

Block Proving Axle Counter (BPAC), to ensure complete arrival of train without manual intervention before granting line clear to the next train, has been provided at 6,364 Block Sections out of 6,607 Block Sections on BG Routes, up to 31.03.2023.

Another important measure to improve safety in train operation is interlocking of Manned Level Crossing gates. It directly improves the safety as the train cannot get the signal to move unless the gate is closed. So, it enhances the safety for the road passengers as well. Up to 31.3.2023, 11,079 out of 17,720 gates have been interlocked with signals on BG routes. Further, 143 existing LC gates have also been interlocked in 2023-24 up to 31.10.2023.

RDSO, along with Indian OEMs, has developed India's own Automatic Train Protection (ATP) System named KAVACH (Train Collision Avoidance System). This state-of-the-art electronic system activates the train braking system automatically if the Loco Pilot fails to control the train as per the speed restrictions. In addition, it prevents collision between two Locomotives equipped with a functional KAVACH system. The system has been provided on 1465 Route Km of Indian Railway on South Central Railway. Contracts have been

awarded for installation and commissioning of KAVACH on New Delhi – Mumbai and New Delhi – Howrah sections (about 3000 route kms)."

Other Safety Measures:

"A GPS- based Fog Pass device is being provided to loco pilots in fog affected areas which enables loco pilots to know the exact distance of the approaching landmarks like signals, level crossing gates etc. 19,652 no. GPS based devices provided during 2014-24 against only 90 during 2004-14.

All Electric locomotives are equipped with Vigilance Control Devices (VCD) to ensure alertness of Loco Pilots.

Retro-reflective sigma (∑) boards are being provided on the mast which is located two OHE masts prior to the signals in electrified territories, to warn the crew about the signal ahead when visibility is low due to foggy weather.

Fencing of tracks at vulnerable locations is being provided progressively."

82. Replying to the action taken on the recommendations of Standing Committee on Railways, the Ministry in their written reply stated as under:

"Audit noticed that the Railways Administration failed to take corrective steps in respect of track renewal, as the targets fixed for track renewal work were not achieved, and there was shortfall in track renewal work. During the period of four years from 2017-2022, there were 890 derailments in the 16 ZRs; out of these, track defect was the cause for 216 (24 per cent) derailments. The Standing Committee on Railways (2016-17), observed/recommended that; "The most serious form of accidents involved is Collision and Signal passing at Danger (SPAD) for which particularly loco-pilots are responsible. The Committee had regretted the lack of technological support to loco pilots for avoiding cases of Signal passing at Danger (SPAD) and collisions. The Committee had also advised the Ministry to thoroughly investigate the reasons for the increasing trend of accidents due to failure on the part of railway staff. Audit noticed that despite operation of fewer Passenger trains due to the Covid-19 Pandemic, 23 SPAD cases were reported in 2020-21. As observed from the Accident Inquiry Reports, the main cause of SPAD cases were due to violation of instructions contained in IR (Open Lines) General Rules. These violations accounted for 47.66 per cent of the total SPAD cases."

83. When asked as to what actions have been taken to ensure that due priority be given to the Track renewal works for elimination of accidents because of permanent way, the Ministry in their written reply stated as under:

"Safety of track is accorded paramount importance in Indian Railways. Every year track renewal works are proposed by Zonal Railways to Railway Board for sanction. All patches due for renewal based on criteria stipulated in IRPWM are invariably shortlisted and works are sanctioned without any exception. Sufficient funds have been arranged for track renewal works. The budget Grant/Revised

estimate and expenditure for track renewal plan head has almost doubled from 2017-18 to 2023- 24. With continuous and assured funding from GBS under Rashtriya Rail Sanraksha Kosh (RRSK), maintenance of track infrastructure and track renewal works have been prioritised and carried out in an extensive manner. new records of rail renewals are being created every year, which confirms the thrust given by Railways towards renewals. Quantum jump in execution of track renewal works has resulted in improved safety performance of track. As a result, the accidents on engineering account has decreased substantially."

84. When asked about the reasons for recurrent accidents/derailments and action taken to avoid accidents/derailments in future and on the related issue of technological aids to loco pilots, the Ministry representative stated as under:

"Sir, there are three-four aspects to this answer on the issue of technological support to the loco pilots. First, I will start with a device which is called the Vigilance Control Device (VCD). If a loco pilot while operating a train become inattentive due to any reason, the first thing that is required is that the he should come to move, and an action should take place. For this, a technological solution has been devised, which is called Vigilance Control Device. This device is being installed in all the locomotives. There are number of operations which a loco pilot has to do while driving a train. If for a continuous period of 60 seconds there is no operation carried out on the loco pilot controls, then an alarm is generated immediately to alert the loco pilot. If the loco pilot still does not act, then the Vigilance Control Device itself switches off the connection supply and applies the break. This is the first safety device which we are providing on the trains. This ensures safety at the very basic level. If for any reason, suppose in the night driving, the loco pilot becomes drowsy or loses attention, and there is no operation in the train for 60 seconds, the Vigilance Control Device (VCD) acts itself. This device has been installed in about 15,000 locomotives. The second thing which I want to mention is related to the visibility of the signal during fog. This is particularly important in the northern belt like Rajasthan, Uttar Pradesh, Bihar, and northeast region. In all these regions there is a problem of fog during the winter season, and also sometimes in the monsoon season. When the visibility of the signal reduces sometimes even to less than 50 meters, whereas the breaking distance of a train is of the order of about one kilometre, unless the driver is able to see the signal well in time, it is not possible for him to control the train. So, this is a GPS based device in which all the data of the signals, stations, level crossings, etc. is available. This device keeps on alerting the loco pilot about the distance of the next signal ahead so that the loco pilot is always alerted whenever he is approaching a signal or a level crossing. This device is also being provided and about 19,742 Fog Past devices have been provided. Since this initiative has been taken in last few years only, you can see the progress here. The third thing is the Sigma Board. This is a retro reflective board which is called Sigma Board. Whenever a train approaches a signal, it alerts the driver. We provide this sigma board which is a retro reflective board. When he sees this, he is alerted that he is approaching a signal. We have already taken these three

steps. The fourth step is automatic application of brake by way of Kavach which is now being brought out."

85. On being asked about the loco pilots indulging in over-speeding of trains and causing 154 incidents on account of this, the Ministry representative stated as under:

"Sir, what we do is that every locomotive is provided with a speedograph which measures the speed. It also records the speed. What is done is that when the loco reaches the shed after completing the journey, the complete data of the speedograph is taken down and analyzed, and wherever there are instances of the loco pilot exceeding the permitted speed, all of them are analyzed. It is a process of our monitoring the loco pilot. Then, the particular instances are pointed out and those particular loco pilots, who have exceeded the speed, are counseled by their supervisors that this is a spot at this place on this particular train where they have exceeded the speed so that they do correct driving. Sir, we have ourselves detected these 154 incidents by way of our process of monitoring the loco pilots. Sir, when a train is being driven, our tracks have got gradients. It is not a flat territory that you are moving only on a leveled track. It has got down gradients also. On the down gradients, the train, because of the momentum, starts gaining speed and the loco pilot is required to control that speed. So, depending upon his driving skills, sometimes, he may not be able to adhere to that. Then, it has to be done."

86. When the Committee highlighted that the Instances are galore of signal passing at danger and collisions and asked for an account of it, the Ministry representative stated as under:

"Sir, firstly, a collision can take place if a driver passes a signal at danger because if a signal is at a danger, it means that that particular train has not been provided the route or the path ahead of that and it may be occupied by another train. So, it can lead to a collision. Sir, instances of drivers passing a signal at danger are taken very seriously. The moment it is detected, then and there the train is stopped and that loco pilot is taken off from the duty, and immediately a high-level inquiry is ordered in that. These instances range from passing the signal by a few metres, may be from two to three metres, to sometimes 100, 200, 300 or 400 metres, depending upon the cause of signal passing at danger in individual cases. Sometimes, it is purely a negligence of the loco pilots; sometimes, there are other reasons. Each and every case of signal passing at danger is very critically analyzed and this is part of our process of monitoring the working of the loco pilots."

87. When asked about the KAVACH and its coverage in terms of number of kilometers and the number of trains, the Ministry representative stated as under:

"The RDSO, along with Indian OEMs has developed India's own Automatic Train Protection System named as KAVACH. This system activates the train braking automatically if the Loco Pilot fails to control the train as per the Signal Aspect and Permanent Speed Restrictions. It prevents collision between two locomotives equipped with a functional KAVACH system. The system has been

provided on 1,465 Route Kms on South Central Railway. Further, contracts have been awarded for KAVACH System on New Delhi-Mumbai and New Delhi-Howrah sections for about 3,000 route kms. The Detailed Project Report is under preparation for 6,274 route kms. Covering Mumbai-Howrah, Delhi-Chennai, Kolkata-Vijayawada and MumbaiChennai sections. Sir, gradually, we have to cover the entire route, but it is a very elaborate system in which complete communication is to be established between the signal and the locomotive. So, we are implementing it gradually. What we have done is that this 1,465 kms. Was a pilot section which was taken up on the South-Central Railway. Now, after this concept was done there, we have taken it up on the New Delhi-Mumbai and New Delhi-Howrah routes. These are the busiest routes on the Railways. Then, Sir, further 6,000 route kms. Where we are preparing the DPR that is the next level of busiest routes which are on what we call the Golden Quadrilateral and its diagonals. Sir, right now, this has been provided on 121 locomotives. The number of trains are more or less around seven to ten trains per day, which is on South-Central Railway."

88. When asked by the Committee as to whether the Kavach was recommended by the Commission of Railway Safety, the CCRS replied as under:

"It was not recommended by us, but it is being implemented by the Railways; and it is a part of the recommendations of the Inquiry of Accident. Adoption of this technology is at a fast pace. The introduction of new technology is a long-drawn process, and therefore, old technology assets cannot be pulled back from service in one go. Human intervention is going to remain for years although they will continue to decrease. Regular counselling, training of the staff and auditing of maintenance practices by the Safety Department of Railways should be further strengthened. Procedure in the execution of work during maintenance and operation, and also during modification is a must. Thank you, Sir."

89. When asked whether the KAVACH system works both in front and rear, the Ministry representative stated as under:

"It will operate on the rear side also. But it is necessary that both the trains should have KAVACH."

90. When asked about the action taken on recommendations of the Committee on Railways regarding technological assistance to the Loco Pilots, the Ministry representative stated as under:

"Sir, there are few dimensions to the technological assistance to the loco pilot regarding signal passing as danger. The first and foremost thing, which I would mention is Kavach. It is specifically designed in such a way that if a loco pilot for any reason fails to stop the train on a signal which is red, the Kovach device itself acts and applies the breaks."

91. In reply to a similar question, the Ministry in their written reply stated as under:

"There are several measures which have been taken by Indian Railways in form of Technological Support to Loco pilots for safer train operation:

1) Fog Pilot Assistant System of Safety device in Loco: FogPAAS displays on-board real-time information of next three approaching fixed landmarks in geographical order accompanied with Audio Alert at 500m on approach. FogPASS alerts the Loco Pilot about approaching landmarks and Loco Pilots have to look out for these landmarks. 19,742 devices have been provided till 2022-23. Retro-reflective sigma boards are provided on the mast which is located between two OHE masts prior to the signals in electrified territories to warn the crew about the signal ahead when visibility is low due to foggy weather.

2) Light Emitting Diode (LED) Signals : IR used conventional filament lamps Signals which posed problems of frequent fusing, signal blanking, required frequent replacement and frequently getting 'Out of Focus'. As a technological input on IR, filament type signal lamps have been replaced by LED based Signals which have greatly improved visibility of signals. LED Signals have been provided at 6,472 stations.

3) Vigilance Control Devices (VCD) in Loco: A vigilance control device to monitor the alertness of the Loco Pilot has been provided in locomotives. In case, the loco pilot fails to acknowledge the alert, it will result in automatic application of penalty brakes.

4) Double Distant Signals: In order to pre-warn Loco Pilots about signal aspect of approaching Stop Signals, 'Double Distant' permissible signals are also provided in higher speed section, as an aid to Loco Pilot to convey the information minimum 2kms in advance and help Loco Pilots to control trains optimally.

5) Simulator based training for improving the driving skills and the reaction time of Loco Pilots is being emphasized.

6) Besides the above, Running rooms are being improved to provide sound rest to the crew at out station. Also families of the running staff are sensitized and counseled the importance of rest at home prior to duty.

7) Indian Railway ATP system KAVACH : Kavach is an indigenously developed Automatic Train protection system which is an aid to Loco Pilot in train running within specified speed limits, by automatic application of brakes in case the Loco Pilot fails to do so and also helps the train run safely during inclement weather. Kavach is a highly technology intensive system, which requires safety certification of highest order. Kavach is being provided progressively over IR."

92. When enquired whether it is the same technology that is used in preventing train accidents in Europe, the Ministry representative stated as under:

"Sir, this is called 'European trains control system' containing Level-1, Level-2 and Level-3. Similarly, there are different systems in other countries like the Chinese system in China, the Russian system in Russia and the Japanese system in Japan. KAVACH has been developed for India."

93. When asked to furnish details of action taken for fulfillment of track renewal targets and also for checking violation of instructions contained in IR (Open Lines)

General Rules which accounted for 47.66 per cent of the total SPAD cases, the Ministry replied in their written reply as under:

"Following steps are taken for fulfillment of track renewal targets and improve overall safety:

(i) Mechanisation of track laying activity through use of track machines like PQRS, TRT, T-28 etc to improve progress of track renewal along with ensuring quality.

(ii) Improvement in quantum of supply of Rails through close coordination with SAIL.

(iii) Maximizing supply of 10 Rail/20 Rail long panels for increasing progress of rail renewal and avoiding welding of joints, thereby ensuring safety.

(iv) Laying of longer rails, minimizing the use of Alumino Thermic Welding and adoption of better welding technology for rails i.e. Flash Butt Welding.

(v) Sufficient funds have been arranged for track renewal works. The budget Grant/Revised estimate and expenditure for track renewal plan head has almost doubled from 2017-18 to 2023-24.

As a result, the targets of track renewal have been exceeded over the years, barring small shortfall during 2017-18 & 2018-19 due to constraint in supply of rails by SAIL during the period.

Regarding checking violation of instructions contained in IR (Open Lines) General Rules which accounted for 47.66 percent of the total SPAD cases.

1. Provision of Vigilance Control Device on all locomotives to alert the crew when the device senses no inputs from the loco pilot or assistant loco pilot on the loco control for a given duration.

2. Provision of retro- reflective Sigma Boards to alert the crew of approaching signals in case of poor visibility.

3. Provision of GPS-based Fogg Pass Device to assist the crew in locating approaching signals in advance during foggy weather.

4. Booking of crew on computerized crew management system with integrated breathalyzers to ensure that crew being booked have adequate road learning, having taken rest as per regulations, are not under the influence of alcohol.

5. Ensuring that crew is aware of the latest safety circulars by mandating that they read and acknowledge the same in the crew lobby.

6. Ensuring training of crew on locomotive simulators.

7. Provision of comfortable air conditioned running rooms for quality rest of crew at outstation locations.

8. Monitoring and counseling of crew by assigned loco inspectors.

9. Regular family counseling of crew.

10. Prohibition on keeping mobile phones in on condition while working trains."

94. On being enquired about the reasons for recurrent accidents/derailments and action taken to avoid accidents/derailments in future, the Ministry in their written reply stated as under:

"Series of measures taken by Indian Railways over the years has resulted in improved safety in train operations. Comptroller & Auditor General's Report No 22 of 2022 brings out that the number of consequential accidents in Indian Railways has come down from 74 in 2017-18 to 20 in 2020-21. The Annual Report 2021-22 of Chief Commissioner of Railway Safety also states that number of accidents has come down from 241 in 2012-13 to 35 in 2021-22. Regarding the increase in the number of train accidents in 2021-22 compared to 2020-21, the Annual Report 2021-22 of Chief Commissioner of Railway Safety points out that fewer accidents took place in 2020-21 because of low overall traffic in view of COVID-19 pandemic related lockdown (and only partial resumption of 230 pairs of trains) during the year 2020-21. There is a steep decline in the number of consequential train accidents from 473 in 2000-01 to 48 in 2022-23. The following measures have been taken by the Government to prevent train accidents over Indian Railways:

"All the accident related data and inquiry findings are entered in the Safety Information Management System (SIMS) module by the concerned Railway, which is being monitored intensively. Indian Railways constantly strives to enhance safety in train operations. Various safety measures have been taken by the Government to prevent recurrence of accidents/derailments

1. Rashtriya Rail Sanraksha Kosh (RRSK) has been introduced in 2017-18 for replacement/renewal/upgradation of critical safety assets, with a corpus of Rs. 1 lakh crore for five years. From 2017-18 till 2021-22, Gross expenditure of Rs. 1.08 lakh crore was incurred on RRSK works. In 2022-23, the Govt. extended the currency of RRSK for another period of five years with Gross Budgetary Support (GBS) of Rs. 45,000 crores.
2. Electrical/Electronic Interlocking Systems with centralized operation of points and signals have been provided at 6475 stations upto 30.09.2023 to eliminate accident due to human failure.
3. Interlocking of Level Crossing (LC) Gates has been provided at 11136 level Crossing Gates up to 30.09.2023 for enhancing safety at LC gates.
4. Complete Track Circuiting of stations to enhance safety for verification of track occupancy by electrical means has been provided at 6543 stations upto 30.09.2023.
5. Detailed instructions on issues related with safety of Signalling e.g. mandatory correspondence check, alteration work protocol, preparation of completion drawing, etc. have been issued.
6. System of disconnection and reconnection for S&T equipment as per protocol has been re-emphasized.

7. All locomotives are equipped with Vigilance Control Devices (VCD) to improve alertness of Loco Pilots.
8. Retro-reflective sigma boards are provided on the mast which is located two OHE masts prior to the signals in electrified territories to warn the crew about the signal ahead when visibility is low due to foggy weather.
9. A GPS based Fog Safety Device (FSD) is provided to loco pilots in fog affected areas which enables loco pilots to know the distance of the approaching landmarks like signals, level crossing gates etc.
10.Modern track structure consisting of 60kg, 90 Ultimate Tensile Strength (UTS) rails, Prestressed Concrete Sleeper (PSC) Normal/Wide base sleepers with elastic fastening, fan-shaped layout turnout on PSC sleepers, Steel Channel/H-beam Sleepers on girder bridges is used while carrying out primary track renewals.
11.Mechanisation of track laying activity through use of track machines like PQRS, TRT, T-28 etc to reduce human errors.
12.Maximizing supply of 130m/260m long rail panels for increasing progress of rail renewal and avoiding welding of joints, thereby improving safety.
13.Laying of longer rails, minimizing the use of Alumino Thermic Welding and adoption of better welding technology for rails i.e. Flash Butt Welding.
14.Monitoring of track geometry by OMS (Oscillation Monitoring System) and TRC (Track Recording Cars).
15.Patrolling of railway tracks to look out for weld/rail fractures.
16.The use of Thick Web Switches and Weldable CMS Crossing in turnout renewal works.
17.Inspections at regular intervals are carried out to monitor and educate staff for observance of safe practices.
18.Web based online monitoring system of track assets viz. Track database and decision support system has been adopted to decide rationalized maintenance requirement and optimize inputs.
19.Detailed instructions on issues related with safety of Track e.g. integrated block, corridor block, worksite safety, monsoon precautions etc. have been issued.
20.Preventive maintenance of railway assets (Coaches & Wagons) is undertaken to ensure safe train operations.
21.Replacement of conventional ICF design coaches with LHB design coaches is being done.
22.All unmanned level crossings (UMLCs) on Broad Gauge (BG) route have been eliminated by January 2019.
23.Safety of Railway Bridges is ensured through regular inspection of Bridges. The requirement of repair/rehabilitation of Bridges is taken up based upon the conditions assessed during these inspections.
24.Indian Railways has displayed Statutory "Fire Notices" for widespread passenger information in all coaches. Fire posters are provided in every coach so as to inform and alert passengers regarding various Do's and Don'ts to prevent fire. These include messages regarding not carrying any inflammable material, explosives, prohibition of smoking inside the coaches, penalties etc.

25.Production Units are providing Fire detection and suppression system in newly manufactured Power Cars and Pantry Cars, Fire and Smoke detection system in newly manufactured coaches. Progressive fitment of the same in existing coaches is also underway by Zonal Railways in a phased manner.
26. Regular counselling and training of staff is undertaken.
27. Concept of Rolling Block has been introduced wherein work of maintenance/repair/replacement of fixed assets (P Way, Signaling and TRD) is planned for 12 weeks in advance on rolling basis and executed as per plan."

95. On being asked about success of the Safety Information Management System, a module created by the Ministry of Railways on the portal, for monitoring of implementation of the accepted recommendations of accident inquiry committees and the modifications to make it more meaningful and beneficial, the Ministry in their written reply stated as under:

"The Safety Information Management System (SIMS) has been very helpful and useful for day-to-day monitoring of accidents and inquiry reports thereon containing root-cause analysis and recommendations of the committee for further improvement. A separate tab to monitor the recommendations /suggestions made by the inquiry committees is being added to the module. The operation of this tab is under trial/process."

96. When asked to furnish the action taken on the reports submitted by the Chief Commissioner of Railway Safety during the last five years, the Ministry in their written reply stated as under:

"Chief Commissioner of Railway Safety / Commissioners of Railway Safety of various Circles carried out inspections either on their own or in company with General Managers and gave 5425 recommendations/ observations in last 5 years (i.e. from 2017- 18 to 2021-22). Out of these, 5378 recommendations / observations (99.13%) have already been complied and balance 47 recommendations / observations are under examination / implementation."

97. When asked about Balasore incident and the inquiry report submitted on it, the CCRS replied as under:

"Sir, it was submitted by the Commission of Railway Safety. We have analysed the cases of accidents. As pointed out earlier also, derailment continues to be the biggest chunk of railway accidents, which is consisting of around 75 per cent, followed by fire accidents which are around 12 per cent, collisions six per cent, and accidents at level crossing are five per cent. Derailments are taking place due to multiple reasons, which include defect in the track/rolling stock, error in driving and a combination of other factors. About the human errors, which we had discussed earlier also, due to railway staff as well as other than railway staff such as road users, passengers and miscreants are responsible for approximately 60 per cent of the total train accidents. Commission of Railway Safety is regularly advising the Railways on various safety related issues. In the last five years, Commission of Railway Safety has given 302 recommendations through various accident Inquiry Reports, and also made correspondences for

the overall improvement in safety. The recommendations are accident-specific, and cover short-term and long-term measures to avoid repetition of accidents. Based on the recommendations of the Commission, the Indian Railways have taken measures to reduce cases of derailments, collisions, fire in coaches, and accidents at level-crossings. There has been a substantial decrease in railway accidents over the years as accidents have drastically come down from 73 in 2017-18 to 48 in 2022-23. However, improvement in safety is a continuous process; and the ultimate objective of zero accidents and zero fatalities have to be achieved. A large number of accidents due to human error highlights the limitation of preventive measures taken by the Railways like counseling, safety drive and training. Human intervention should be minimized through the use of technology. Over the years, the Railways have taken various initiatives for the introduction of new technologies, for the maintenance of assets, signaling, interlocking, Kavach. LHB coaches, use of fire-retardant materials etc. These technologies are to be fast-tracked; these are required to be implemented at a faster pace."

98. When enquired about detection of any major lacuna regarding the Balasore train accident, the Ministry representative replied as under:

"Sir, I would briefly explain it; and then the CCRS can supplement. We are commonly calling it the Balasore accident. The accident occurred at a station called Bahanaga Road. The Coromandel Express was to pass through this Bahanaga Road Station. It was an up direction train. The signals for this train were given 'green.' That means, when the train was approaching the station, we have a home signal which is provided before the station, and that was green. Then, there are subsequent stations. The signals were given 'green' on the mainline. So, the train was required to go through the mainline. However, when the train came to the station, instead of going through the mainline, its route was set for the loop line, and this train went into the loop line. On the loop line, already a goods train was stationed; and this train went and collided with that goods train. Sir, this station is provided with electronic interlocking, which means, the interlocking between a signal and the route (route means when we set the point for a particular direction) are interlocked. So, this interlocking is done electronically at this particular station. Prior to the electronic interlocking, we used to have less technical systems which were mechanical and panel interlocking etc. But electronic interlocking is one of the most advanced systems of interlocking; and it is entirely software based, and nothing can go wrong with this particular system. What happened at this particular station prior to the passage of this train was that there was some maintenance work carried out by the signaling staff in a goomti near a gate. So, near the gate, there was a goomti in which there were certain circuits. When a signal is sent through these circuits, the command goes through the point, and they are operated. The signaling staff who was working there, was not working for any work as such in the track or in the point. They were basically working for some modifications to be done in the gate which is operated from the same goomti. But, Sir, for whatever error, they had carried out certain wrong wiring during the course of the maintenance which led

to this kind of a wrong route setting, and eventually led to this accident. This is what I would say, basically is behind it. It is something wrong done by the staff who worked inside the goomti. Now, I think, CCR can supplement what I said.

99. In reply to the same question, the CCRS supplemented by stating as under:

"Sir, as said by the Chair, the signaling modification work was going on there, and the signaling staff was working there. During the process of modification, the standard practices which have been mentioned in the Manuals and Work Instructions were not followed, and that is why this accident occurred. The green signal was given although the point was set for the loop line."

100. When the Committee enquired about the possibility of the interlocking system having malfunctioned, leading to the Balasore disaster, the Ministry representative replied as under:

"Sir, the electronic interlocking by itself cannot go wrong because it is entirely software based. It is embedded in the system. So, it cannot go wrong. It is not possible to go inside the electronic interlocking unless there is something, which is done by way of altering the software. If somebody deliberately alters the software, then only the electronic interlocking can change. When we install electronic interlocking, a complete circuit is prepared. It is a very detailed circuit, and a lot of tables are prepared on how the train will operate in different combinations and all that is first tested in the factory where the software is prepared. A mock test is done."

101. When enquired as to how far is the goomti, where this tampering or manipulation of the interlocking system could have taken place manually, from the site of accident and apprehended that if this is the situation, anything can happen anywhere, the Ministry representative replied as under:

"Sir, I will answer both the things. Firstly, the location from where the Station Master sits to the goomti is approximately 700-800 m. distance and from the goomti to the point where the derailment started is also around 100-200 m. distance. This is the kind of distance, which is there. The distance is not much from the goomti to the point, and from the goomti there is a level crossing, beyond that there was track and then point. This was the site situation. You have raised a point that if this is a situation, then this could happen everywhere. This is what I am trying to explain. Firstly, the electronic interlocking by itself is fully tested in the factory for various combinations of train movement, and after it is installed at the site and before its commissioning again at site it is tested for various combination and once it is certified that all the testing are correct, then only it is commissioned. Since it is embedded software, once it is commissioned unless the software is altered, this cannot change. In this particular case, whenever a modification is to be carried out in a signaling system at the site, then we have to take a disconnection between the interlocking and the actual operation of the point or the signal, and then after carrying out the work again a re-connection has to be done. This process -- for certain type of operations -- can

be done under traffic and for certain type of operations it has to be done by stopping the traffic. So, for various types of works there are different rules. Before restoring the traffic, they have to check that what they have done has been done correctly, and then only the traffic is to be allowed to pass. If all these protocols are properly followed, it cannot go wrong. In this particular case, he has carried out for whatever reason --by error or by negligence --a wrong wiring. He was not supposed to work at all on the circuit of the point whereas he altered the circuit of the point. He was to work only on the circuit of the gate, which is a lifting barrier at the gate. So, instead of the lifting barrier, he worked on the circuit of the point, which was not required to be done. So, that is how this error crept in. We already have sufficient protocols, but having learned from this accident, we have further strengthened these systems keeping in view this particular type of mistake, which had taken place. A number of instructions have been issued from the Railway Board and also a lot of precautionary steps have been taken in the field. We are carrying out an elaborate exercise of rechecking the conformity of the circuits with the drawing at all the stations. So that exercise is going on at all the stations. Secondly, we have also initiated a process that the opening and closure of such goomtis should not be merely at the control of the Signal Maintainer. It should be a dual control by the Station Master as well as by the Signal Maintainer. So, instructions have been given for a double locking of such goomtis. Such instructions already existed for the Relay Rooms, which are located at the Station itself. They are under the double lock control. Now, that has been extended to even such goomtis where such maintenance work is to be carried out. Besides that, we are carrying out an extensive counseling of all the maintenance staff in respect of following the right procedures because as CCRS also pointed out that had he followed the laid down instructions, then this incident would not have taken place. So, that extensive counseling of 100 per cent staff is being carried out in the field itself so that they follow the right practice. Another step, which we have taken and one of the observations in the Audit Report is regarding availability of maintenance blocks, which they have commented in their Report. I think that the hon. Members will recall that there was an accident at Khatauli where the accident took place because certain maintenance work was being carried out on track without taking the proper maintenance block. It led to the accident and casualties of passengers in that train. I think that was also in the back of the mind of the audit. They have critically examined the availability of the maintenance block. I would like to inform the Committee, since 2020, a very exhaustive exercise has been carried out for review of all the time tables where assistance of IIT Bombay was taken and we call it 'Zero Based Time Tabling' exercise and maintenance corridors have been provided on all the sections so that a window of two to three hours is available on each section for carrying out the maintenance. Recently, to further strengthen availability of maintenance time for the maintenance of particular tracks, signaling and our overhead equipment etc., we have introduced a system of rolling block programme. We prepare it for one or two weeks. A day-to-day maintenance programme is being prepared. Along with that, a maintenance block will be granted and the maintenance works will be carried out so that all the agencies which are working whether it is P. Way

Maintenance Staff or the Signaling Maintenance Staff can take care of it. The track machines also require maintenance blocks for working. All this is being programmed on day-to-day basis now under the Rolling Block Programme which is reviewed on weekly basis so that all the maintenance work are properly planned and carried out. Besides, we have also initiated an exercise of inter-divisional and inter zonal safety audits. We already have a system of inter-divisional and inter-zonal safety audits which we carry out every year for every division and for every zonal railway. We have carried out a special drive for such inter-divisional and inter zonal safety audit. We have issued many instructions to further strengthen the operation and maintenance practices from the safety point of view."

102. When enquired about the overhauling the entire safety mechanism as far as the interlocking is concerned, the Ministry representative replied as under:

"Sir, I will briefly explain what has been the progress of evolution of interlocking system on the Indian Railways. Earlier, we used to have mechanical interlocking which means there used to be cabins where there were levers and a cabin man will operate number of levers. First, he will set the route and then he will by way of the lever operate the signal. So, this was mechanical interlocking where the route was set mechanically, and then the signal was operated. From that, we have graduated to a Panel Interlocking or Route Relay Interlocking. In this system, the entire interlocking is by way of relays which are provided in a relay room. These are large number of switches through which a large number of circuits are prepared and wiring is done. Because of the large number of wiring and circuit, it did have certain vulnerability because the more is the number of wires and the more is the number of connections, the more are the chances of error or consequent problems. What happens in electronic interlocking is that the entire interlocking programme is brought on the software and only the operation part, that is the actual operation of the signal or the point, is then acting through the relay. So, this leads to a drastic reduction in the number of relays or switches which are there and the number of wires and connections which are required to be provided. We are also now studying possibilities of further reducing these circuits by use of solid-state interlocking. This is a work in progress."

103. When enquired as to whether the inquiry report has revealed the reason for the Balasore disaster, the Ministry representative replied as under:

"Sir, the Commissioner of Railway Safety's inquiry report says that we have received a technical analysis of the cause of the accident that certain wrong wiring was done which led to the accident. Was it due to negligence or was a willful act? That would be beyond the domain of the Commissioner of Railway Safety. As the hon. Members may be aware, concurrently, an inquiry is in progress by Central Bureau of Investigation. That inquiry is still in progress. After the initial investigation, they have arrested three of our employees. When we get to know about the findings, we will inform you."

104. On being enquired as to what are the areas of operational network where we are yet to catch up in view of the global expectations of 'fatality free' performance, the Ministry replied in their written reply as under:

"The best global practices in Railways are taken into account and adopted over the years in improvement of assets e.g. Signaling, Track and Rolling Stock etc.

Improvements in Signalling Systems

• Electronic Interlocking

• Replacing earlier generation mechanical signals by Panel Interlocking/Route Relay Interlocking/Electronic Interlocking (PI/RRI/EI) along with Multi Aspect Colour Light Signals provided at 6,396 Stations out of 6,506 Stations on BG Routes, up to 31.03.2023.

• Electronic Interlocking have been provided on 3045 stations, up to 31.03.2023.

• Use of Block Proving Axle Counters

• Block Proving Axle Counter (BPAC), to ensure complete arrival of train without manual intervention before granting line clear to the next train, provided at 6,364 Block Sections out of 6,607 Block Sections on BG Routes up to 31.03.2023.

• Kavach (Automatic Train Protection System)

• RDSO, along with Indian OEMs, has developed Automatic Train Protection (ATP) System named KAVACH (Train Collision Avoidance System). First field trials on passenger trains started in February 2016. Based on the experience so gained and Independent Safety Assessment of the system by a 3rd party (Independent Safety Assessor: ISA), Kavach was adopted as a National ATP system in July 2020.

• Kavach already deployed on 1465 Route km and 121 locomotives (including Electric Multiple Unit rakes) on South Central Railway.

• Tenders have been awarded for Delhi –Mumbai & Delhi – Howrah corridors (approximately 3000 Route km) and work is in progress on these routes. Includes KAVACH for 760 locomotives

• Indian Railways is preparing Detailed Project Report (DPR) and detailed estimate for another 6274 RKm covering Mumbai-Howrah, Delhi-Chennai, KolkataVijayawada and Mumbai-Chennai routes.

Preventing Collisions: Other Assistive Technology for Crew

• Vigilance Control Device: All locomotives have been provided with VCDs that alert the loco pilots in case of inactivity

• Fog-Pass Safety Devices: These are GPS-based devices that alert the loco pilot regarding approaching signals, gates etc., and are used during foggy weather where visibility is reduced. 19,742 fog pass devices provided until the end of 2022-23.

• Retro reflective sigma Board: These are provided on masts and glow under locomotive headlight alerting the loco pilot of approaching signal in low visibility.

Improvements in Track Structure

a) Track Upgradation: Earlier the track structure used to be largely 90R (44.5 Kg/m) or 52 Kg (72/90 UTS) rail. This is being gradually replaced with 60 Kg, 90 UTS rail which has higher strength.

b) Welded Rails: Short-welded rails of 39m length and single rails converted into long welded rails. Short-welded rails of 39m length and single rails limited to locations, where welded rails are not permitted on technical grounds

c) Population of Alumino-Themit (AT) welds progressively reduced by using Longer Rail Panels with one/two/three Flash Butt Welds from rail manufacturing plant. Flash Butt welds are of higher quality with least chances of internal defects and in turn improve safety.

d) PSC Sleepers: Normal/Wide base 60 kg PSC sleepers with elastic fastening on plain track and PSC sleepers on turnouts are used while carrying out primary track renewals

e) Steel Channel/H-beam Sleepers Old wooden sleepers on bridges are being replaced with Steel Channel/H-beam Sleepers, while carrying out primary track renewals. H-Beam sleepers are stronger than Steel channel sleepers and have better quality control in fabrication.

f) Thick Web Switches: A new design of switches which can handle higher turnout speed with more life and reliability, as compared to ordinary over-riding switches. These switches introduced in 2016, improve safety and riding comfort.
g) Weldable Cast Manganese Steel Crossing improves safety by reducing fracture proneness and elimination of fish plated joints. Planned for routes of higher speed and heavier axle load.

Improvements in Maintenance

a) Maintenance Block: Zero Based Time Table initiative taken in Sep-2020, which provides for Corridor Blocks for maintenance. To further reinforce, Rolling Block Program introduced from 12.06.2023- integrated maintenance of infrastructure (P Way, TRD & Signalling); prepared for 2 weeks for each traffic section and each route.

b) Mechanization: Track Machines: IR has a fleet of 1548 modern track machines for mechanized maintenance and relaying of track. Further 369 Track Machines will be supplied by March 2025 (Purchase Order placed), and additionally, 1602 are to be procured progressively by 2030.

c) Deep Screening of Ballast– To improve the drainage and resilience of track. This helps in maintenance of track to required standards.

d) Track Recording: Monitoring of track parameters done through regular runs of Track Recording Cars (TRC). Two additional TRCs added in the year 2022-23 to

the earlier fleet of 5 TRCs and one is under commissioning. 7 more sanctioned and are under procurement.

e) Oscillation Monitoring System (OMS): Oscillation Monitoring System that identifies bad running locations to ensure safety of trains & riding comfort of passengers. Locations where Vertical or Horizontal acceleration recorded exceeds threshold limit require attention. IR has 116 such systems- approximately 10 lakh Kms track recorded every year by OMS.

f) Ultra Sonic Flaw Detection (USFD) of Rails: Rail and Weld defects are identified by using Single Rail Testing (SRT) / Double Rail Testing (DRT) using A-Scan Analog USFD Machines. To further improve digital capturing of data & monitoring, IR has adopted improved technology of B Scan 9 channels USFD testing machines in Feb 23.

Bridges: Technological Intervention in Bridge maintenance

a) An IT application -Bridge Management System (BMS) - adopted, covering details of all Bridge assets and Inspection modules- visible at all levels.

b) Instrumentation for Bridge health monitoring provided at 25 bridges & planned for 64 bridges.

c) Under water inspection by Robotic Vehicle done at 175 bridges & planned for 66 bridges in 2023-24.

d) Continuous River Bed Profile Management System adopted at 39 bridges & planned for 31 bridges in 2023-24.

e) Continuous Water Level Monitoring System provided at 311 bridges & planned for 97 bridges in 2023-24.

f) Continuous Scour Depth Management System provided at 3 bridges & planned for 16 bridges in 2023-24.

Improvements in Rolling Stock

a) Replacement of conventional ICF design coaches with superior LHB design coaches: Production Units of Indian Railways are manufacturing only LHB coaches from 2018-19 onwards. LHB coaches are provided with superior crashworthy, Fire Safety and anticlimbing features.

b) Maintenance mechanization for timely detection of faults: Non destructive flaw detection of axles and wheel discs:

i. Ultrasonic testing of axles

ii. Eddy current array testing of wheel discs

c) Wayside Condition monitoring for trains on the run: Mechanized systems like Online Monitoring of Rolling Stock (OMRS), Wheel Impact Load Detector (WILD), Hot Box Detection Systems (HBDs) and Hot Axle Hot Wheel systems (HAHWs),

to detect any incipient defect in components while coaches / wagons are on run, are being inducted & proliferated.

d) Fire Safety Features:

i. Use of fire retardant furnishing material in coaches

ii. Use of heat resistant E-beam cables for coach wiring

iii. Aerosol- based fire suppression cartridges being provided in all electrical cubicles in LHB/ ICF coaches and EMU/ MEMU Cars iv. Provision of fire detection and suppression system in Power Cars and Pantry Cars and Fire and Smoke detection system in coaches besides Fire Extinguishers.

e) Improved Safety Features in Freight Wagons

i. Improved design Open Wagons: Adoption of open wagons (corrosion-resistant and stronger stainless steel) for transport of bulk commodities: Total about 1 lakh such wagons introduced.

ii. Upgraded Bearings: Upgraded bearings having low torque grease seals and polyamide cage being adopted progressively for reducing online bearing failures. 5,00,000 such bearings already introduced

iii. Upgraded High Tensile Centre Buffer Coupler (CBC): Upgraded CBC having better mechanical properties introduced for reducing incidence of train parting. Complete switch over done to this type of CBC since Mar'20 for new procurement.

Level Crossing Gates

Unmanned Level Crossing gates: All UMLCs eliminated from the BG route.

Manned Level Crossing Gates:

i. Manned Level Crossing gates are being progressively interlocked with signals
ii. Non-interlocked MLCs being equipped with voice recording system

iii. With progressive building of ROBs and RUBs, all technically feasible MLCs will also get eliminated."

105. When asked as to what innovative measures Railway Administration has taken/proposes to incorporate in the human and physical infrastructure for foolproof modus operandi of the Indian Railways on international standards, the Ministry in their written reply stated as under:

"Innovative measures are regularly being taken by Railways in different fields of working based on the problems faced with the existing system to improve upon. Based on the problems faced, problem statements are made and technical solutions from start-ups, educational institutes and industry partners etc are asked for, through IR innovation portal for finding effective solution. Proliferation

of in-motion loco simulators is planned for training of the Loco pilots for improving their driving skills and response time."

Para No.3.4.1: Timeliness in completion of inquiries/investigations

106. In February 2006, Railway Board emphasized that ZRs should make efforts to finalize the inquiry reports as early as possible but not beyond the prescribed time limits. Time taken at different stages of Accident Inquiries was available in 854 cases out of 1127 selected cases over 16 Zonal Railways. Audit noted delays in different stages of accident inquiries. Audit noted that the inquiry reports were not submitted to the accepting authority within the time schedule prescribed by Railway Board in 63 per cent cases. The delay in submission of the inquiry report had a cascading effect of delay in acceptance of the reports by the accepting authority. Audit also noted that in 49 percent cases, there was delay in acceptance of the reports by accepting authorities.

107. When the Committee enquired about railway accidents and enquiries made, the CCRS made the following submission:

> "It is mandatory to have inquiry. If there is no death but property loss is more than Rs. 2 crore, then also it has to be done. Other accidents are inquired by the Railways. In the 32 accidents which are inquired by the Commission of Railway Safety, we have given around 302 recommendations and the Action Taken Report from the Railways have been received for 23 inquiries which is around 72 per cent. Two inquiry reports have been submitted recently in the month of April and June. In the last few years, there has been a considerable improvement in the compliance of ATRs. As of now, only seven ATRs are pending. As regards recommendations, in the 23 inquiry reports which we have submitted, 92 per cent recommendations have been accepted; balance 18 recommendations are under consideration of the Railways. As of now, nil report is pending in the Commission for the inquiry. We do not have any pending inquiry to be carried out by the Commission."

108. When asked as to what actions have been taken/proposed to be taken by the Railway Administration to ensure strict adherence to the scheduled timelines for conducting and finalization of Accident Inquiries, the Ministry in their written reply stated as under:

> "The focus of accident inquiries is to carry out thorough analysis so as to arrive at the "root cause" of the accident. As per complexity of an accident case, multiple witnesses are required to be examined, detailed investigation reports e.g. Metallurgical, Chemical test reports from Laboratories, RDSO, Forensic Examination report from state agencies and other external agencies are required by the Inquiry Committee to arrive at the 'root cause' of the accident for taking corrective and preventive actions. In February 2006 Railway Board had prescribed the timeline of D+10 days for Departmental Inquiry in Consequential Accidents. This timeline was revised to D+30 days in view of the above-mentioned complexities in December 2019. The progress of departmental

inquiries for their early finalization is monitored at the highest level at Zonal Railway Headquarters as well as at Railway Board."

109. When enquired about Balasore accident, the CCRS stated that the final inquiry report has been submitted on 20th June to Railways by the Commission of Railway Safety.

110. When asked about the steps taken for ensuring strict compliance in respect of recommendations made by the accident inquiry committees, the Ministry in their written reply stated as under:

> "Ministry of Railways has created a module on the portal. Safety Information Management System, for monitoring of implementation of the accepted recommendations of accident inquiry committees and relevant necessary instructions have been issued to Zonal Railways regarding using the module. The departmental inquiry committees in Zonal Railways are constituted of officers from different disciplines viz. Traffic, Engineering, Electrical, Mechanical and Signal & Telecom. The final findings are arrived at after investigation and deliberation jointly by the members of these committees. The committees' recommendations are implemented by zonal railways. Further, zonal railways have been directed to include, inter alia, the actions required on their part to implement the recommendations from accident inquiry findings in their safety action plans."

Para 4.2 Funding of Rashtriya Rail Sanraksha Kosh (RRSK)

111. The Standing Committee on Railways recommended (March 2018) the Ministry of Railways that "at the time when there is rapid growth in net revenue of Railways and a lot of funds were needed for capital asset creation, funding to and expenditure from RRSK for safety purposes should be ensured at highest level in order to accord paramount to the safety". In this regard, Audit noted that there has been an assured funding of Rs.15000 crore out of the 'Gross Budgetary Support' and Rs.5000 crore (25 per cent) of the total contribution of Rs 20,000 from 2017-18 to 2020-21 per year to this fund to be met from Railways internal resources had been falling short of target to the tune of Rs. 15775 crore constituting 78.88 % during the years 2017-18 to 2020-21.

112. In their background note, the Ministry have stated as under:

> "Rashtriya Rail Sanraksha Kosh (RRSK) was introduced in 2017-18 for replacement/renewal/upgradation of critical safety assets, with a corpus of Rs 1 lakh crore for five years, having an annual outlay of Rs 20,000 crore. Gross Expenditure of Rs.1,08,743 crore has been incurred on RRSK works till the end of 2021-22. Funds under RRSK are utilized for Safety works relating to Traffic Facilities, Rolling Stock, Level Crossings, Road Over/Under Bridges, Track Renewal, Bridge Works, Signal and Telecom Works, Other Electrical Works, TRD Works, Machinery and Plant, Workshops, Training/HRD, Passenger Amenities and Other Specified works. On the recommendation of NITI Aayog, the Government has agreed to extend the currency of RRSK for another five-

year term beyond 2021-22, with contribution of Rs 45,000 crore from GBS. In 2022-23, an expenditure of Rs. 11,797.42 crore has been incurred and in 2023-24, a provision of Rs. 11,000 crore has been made under RRSK."

113. When asked about the reasons of enormous deficit in generation of internal resources and the difficulties/challenges in meeting the targets out of internal generation and whether Railways have analyzed as to how the said deficit is contributing to the number of rail accidents, the Ministry in their written reply stated as under:

"Rashtriya Rail Sanraksha Kosh (RRSK) was created in 2017-18 for execution of assessed safety works with a corpus of Rs. 1 lakh crore over a period of five years. RRSK works are to be funded from Gross Budgetary Support and Railways revenues/resources; including mobilization of resources through Extra Budgetary Resources (EBR), as per Ministry of Finance's guidelines through OM No. 35(06)/PF-II/2016 dated 5.7.2017, Para-I(6) where it has been laid down that the "Railways may also mobilize resources through other Extra Budgetary Resources, including market borrowings or Public Private Partnerships wherever feasible for carrying out safety works."

During this period, Railways' internal resource generation was adversely affected following Covid Pandemic which led to passenger trains completely halting and freight trains running with only essential commodities. Despite pandemic and other recessionary conditions, IR provided funds for incurring gross expenditure of Rs.1.08 lakh crore on RRSK works from 2017-18 till 2021-22. This includes over Rs.27000 crore in 2020-21. GOI also increased GBS support by Rs.10000 crore in 2021-22.

The resource gap from 2019-20 to 2021-22 was mainly on account of Covid pandemic. With the improvement in the net revenue position on account of higher incremental loading and passenger revenues along with astute expenditure management, MoR is able to supplement RRSK from 2022-23. While in 2022-23, the Government has extended the currency of RRSK for another period of five years w.e.f. 2022-23 with total GBS of Rs.45000 crore, against RE 2022-23 provision of Rs.1000 crore to RRSK from internal resources, IR has contributed Rs.1797 crore considering requirement of funds. In 2023-24, Rs.1000 crore from internal generation have been budgeted.

In the overall, though IR's contribution from internal generation fell short of target in view of position explained above, there has been no deficit of funds for RRSK works, which have progressed as per their targets in line with MoF guidelines.

NITI Aayog appreciated Railways' progress on safety and implementation of RRSK and held that safety indicators have shown improvement after implementation of RRSK."

Para 4.3 Utilization of RRSK

114. RRSK was created with a vision to have a single head in order to cater all safety related needs. The Railway Administration failed to act in accordance with the

observation of the Standing Committee on Railways (2016-17), wherein it was observed that the physical as well as financial targets in respect of track renewals need to be enhanced as per the annual requirement for track renewals for safety. Indian Railways failed to prepare the 'Detailed Outcome Framework' for each item of safety work as per the indicative outcomes suggested by the 'NITI-Aayog', to gauge the benefits derived out of the RRSK funds in conformity with the objectives behind the creation of the Fund.

115. When asked as to why did Railways fail to prepare the 'Detailed Outcome Framework' for each item of safety and by what time does the Railway Administration propose to come up with the detailed outcome framework/analysis for each item of safety work as suggested by NITI Aayog, the Ministry in their written reply stated as under:

> "Definite outcomes have been targeted and achieved by focused expenditure and efforts on the same. Rashtriya Rail Sanraksha Kosh (RRSK) was introduced in 2017-18 for replacement/renewal/upgradation of critical safety assets, with a corpus of Rs.1 lakh crore for five years, having an annual outlay of Rs. 20,000 crore. Gross expenditure of Rs. 1,08,743 crore was incurred on RRSK works in the 5 years till the end of 2021-22. Currency of RRSK has been extended for another five- year term beyond 2021-22, with contribution of Rs 45,000 Crore from GBS. In RRSK, priority is given to track renewal works. Outcome indicators have been identified and reduction in rail/weld failures has been achieved as a result of track renewals done with the increased fund allocation.

Type of failure	2017-18	2022-23	Reduction
Rail Fracture	1671	531	68.22%
Weld failure	2604	724	72.19%

There has been sharp reduction in consequential train accidents, including derailments, LC accidents and causalities and injuries as can be noted from the table below:

S.No	Particulars	2017-18	2018-19	2019-20	2020-21
1	**Category wise Consequential Train Accidents**				
i	Number of Derailments	54	46	40	17
ii	Number of Collisions	3	0	5	1
iii	Number of Manned Level Accident Crossing	3	3	1	1
iv	Number of Un-Manned Level Crossing Accident *	10	3	0	0

v	Number of Fire accidents	3	6	8	3
vi	Misc. Accident	0	1	1	0
	Total	**73**	**59**	**55**	**22**

All unmanned level crossings (UMLCs) on Broad Gauge (BG) route have been eliminated by January 2019.

Fatality / Injury

Particulars	2017-18	2018-19	2019-20	2020-21
Fatalities	58	37	5	4
Injuries	81	29	21	0

116. When a description of the factors that are obstructing the fulfillment of the objectives of the RRSK both in terms of contribution from the budgetary allocation and internal generation of resources, their utilization and others was sought, the Ministry in their written reply stated as under:

"Rashtriya Rail Sanraksha Kosh (RRSK) was created in 2017-18 for execution of assessed safety works with a corpus of Rs. 1 lakh crore over a period of five years. RRSK works are to be funded from Gross Budgetary Support and Railways revenues/resources; including mobilization of resources through Extra Budgetary Resources (EBR), as per Ministry of Finance's guidelines. During this period, Railways' internal resource generation was adversely affected following Covid Pandemic which led to passenger trains completely halting and freight trains running with only essential commodities. Despite pandemic and other recessionary conditions, IR provided funds for incurring gross expenditure of Rs.1.08 lakh crore on RRSK works from 2017-18 till 2021-22. This includes over Rs.27000 crore in 2020-21 through EBR. GOI also increased GBS support by Rs.10000 crore in 2021-22. In 2022-23, the Government has extended the currency of RRSK for another period of five years w.e.f. 2022-23 with total GBS of Rs.45000 crore. Against RE 2022-23 provision of Rs.1000 crore to RRSK from internal resources, IR has contributed Rs.1797 crore in view of requirement of funds. In 2023-24, Rs.1000 crore have been contributed. In the overall, though IR's contribution fell short of target in view of position explained above, there has been no deficit of funds for RRSK works, which have progressed as per their targets. NITI Aayog appreciated Railways' progress on safety and implementation of RRSK and held that safety indicators have shown improvement after implementation of RRSK.

Gross Expenditure on RRSK Works

(Rs. in Cr)

	Actual 2017-18	Actual 2018-19	Actual 2019-20	Actual 2020-21	Actual 2021-22	Total 2017-18 to 2021-		Actual 2022-23	BE 2023-24

						22			
Traffic Facilities	654.02	498.23	370.78	523.49	476.93	2523.45		591.38	700
Railway Research									1.00
Rolling Stock	1099.10	1637.28	1116.15	2969.73	2798.26	9620.52		1812.43	1600.00
Level Crossings	535.99	678.60	570.25	544.92		2329.76		0.15	
Road Over/Under Bridges	3175.23	3488.82	2334.15	4086.45	1736.18	14820.83		1500.80	1900
Track Renewals	8903.99	9697.31	8314.30	13509.49	16262.45	56687.54		4196.71	1400.00
Bridge Works	451.34	516.72	752.59	730.38	1286.13	3737.16		1041.36	1200.00
Signal & Telecom Works	1201.01	1461.29	1536.60	1829.99	2058.25	8087.14		2200.78	2178.12
Other Electrical Works	18.76	47.02	301.10	460.18	488.53	1315.59		541.62	800.00
Traction Distribution Works	331.48	302.77				634.25			
Machinery & Plant	127.10	179.82	162.94	226.33	349.48	1045.67		195.61	240.00
Workshops PUs	240.96	202.67	256.08	608.95	354.82	1663.48		317.14	380.00
Customer Amenities	462.55	795.09	870.12	1915.99	1176.02	5219.77		1093.74	1150.00
Other Specified Works		42.00	141.17	235.72	329.44	748.33		324.67	510.00
Training/ HRD	58.00	48.01	73.38	71.69	58.00	309.08		78.45	250
Total	17259.53	19595.63	16799.61	27713.31	27374.49	108742.57		13894.84	12309.12

In 2021, due to lesser GBS allocation, funds from EBR(S) were also deployed for RRSK works

Due to assured funding under RRSK, the Budget allocation and expenditure over Indian Railway network for track renewal works has almost doubled from 2017-18 to 2023-24 as seen below:

Year	**Budget Grant/ Revised Estimate (Rs. in Cr)**	**Expenditure (Rs. in Cr)**
2017-18	9305	8884
2018-19	10112	9690

2019-20	10120	9390
2020-21	10599	13523
2021-22	15887	16558
2022-23	15388	16325
2023-24	17297	-

Due to increased allocation and thrust on track renewal works, reduction in number of rail/weld failures have been achieved, thereby fulfilling the objectives of RRSK, as given below:

Type of failure	2017-18	2022-23	Reduction
Rail Fracture	1671	531	68.22%
Weld failure	2604	724	72.19%

Para No.6.2: Fire accidents in coaches

117. The Standing Committee on Railways stated that the instances of accidents due to fire in trains are not many yet the casualties in such cases are usually very high. Audit noticed that out of the identified 44,407 coaches on 12 ZRs, fire extinguishers have not been provided in 27,763 (62 per cent) coaches. The reasons for non-provision of fire extinguishers were: (i) delays in tendering processes, (ii) failure of firm to supply the fire extinguishers, (iii) supply awaited/under progress etc.

118. The Ministry in their background note replied as under:

"Measures taken to prevent fire in coaches: -

Usage of fire retardant furnishing materials in coaches. Provision of fire detection and suppression system in Power Cars and Pantry Cars and Fire and Smoke detection system in AC coaches. Provision of fire extinguishers in all AC coaches and all newly manufactured Non-AC coaches. Display of statutory "Fire Notices" for widespread passenger information in all coaches."

119. When asked about the status of procurement of fire extinguishers for the identified coaches, the Ministry in their written reply stated as under:

"Fire Extinguishers are already provided in all Pantry/Power Cars, AC Coaches and SLRD coaches. All Non-AC coaches are also being provided with Fire Extinguishers. The work is in progress and 36663 coaches have been covered. The balance 389 Non-AC coaches will be completed by 31.03.2024"

120. On being asked about the plan of Indian Railway to achieve 100 per cent installation of fire extinguishers in coaches, the Ministry in their written reply stated as under:

"It is planned to cover all coaches with fire safety system by March 2024."

121. When enquired as to whether financial constraint and shortage of staff have been factors in the process of procurement and installation of fire extinguishers, the Ministry in their written reply stated as under:

> "No, there has been no financial constraint or shortage of staff in regards to the process of procurement and installation of fire extinguishers."

122. When the Committee expressed apprehensions that out of the identified 44,407 coaches on 12 Zonal Railways, fire extinguishers have not been provided in 62 per cent of the coaches and that this is a serious indictment, the Ministry representative replied during oral evidence as under:

> "It has been installed in 39000 coaches. There were hiccups at the initial stage. The procurement related problem has been solved and the work is now in full swing."

123. When the Committee asked as to how things would move properly if it takes so long to install the fire extinguisher even after allocation of sufficient funds, the Ministry representative replied during oral evidence as under:

> "There was no scarcity of funds. The problem was in procurement. Besides, we are moving towards online detection of defects of coaches and wagons. We have made a beginning and the problem that crops up is that the wheel gets flat which starts impacting the rail and therefore, it becomes important to detect it. We are installing wheel impact load detector. The second problem is with the rolling stock. The bearing gets seized and the axle may break due to heat. It is important to detect it after heating up and we are getting online hot box detection system. Till now we have installed 25 online monitoring of rolling stock system, wheel impact load detector and 321 hot box detectors which will detect the defect in the running train. There is another important aspect and that is accident due to human error. We are constantly endeavoring as to how we should train so that safe operation practices are followed. We have concentrated the most on training. There are zonal training institutes in the zonal railways. Besides, there are discipline-wise institutes for technicians working for maintenance and we are training them for maintenance and training procedures. We provide initial training. After that, periodically, regular training is being imparted, which we call as refresher course, and in the refresher course, all the important instructions are repeated or reiterated to them so that their knowledge is refreshed. Besides that, we are also conducting promotional courses. When any employee is promoted and he is given a higher responsibility, we are conducting promotional courses. We also conduct special courses which are targeted. Whenever we identify a particular area of railway working which requires more training, then we are giving specialized training courses. So, these are the four categories of courses which we are imparting to our employees. We have constantly laid emphasis on more and more training. So, while in 2010-11, the number of employees trained per year was of the order of three lakhs in a year, this has now been increased to five lakhs employees trained per year to intensify the training being imparted to the employees. The second thing, which one of the hon. Members pointed out,

was regarding the training of loco pilots. So, for that purpose, we have got simulators. So, we have installed simulators, and the loco pilots are sent on simulator. A simulator simulates the condition of a train operation, and the loco pilot is trained on that simulator so that before he actually goes on the train, he is trained on a simulator. They are also trained on practices like what is right and what is wrong in train operation. Also, we are imparting training to our onboard staff regarding firefighting and use of fire extinguishers so that in the case of an event of fire, they can immediately respond in the situation and provide the golden hour reaction to the fire situation. Also, stress is an important factor in railway operation because the staff members are continuously concentrating on operation. So, we are also imparting training in yoga and meditation to our employees so that their mental well-being is improved. This is about the important aspect of training that we are imparting."

Para No.6.3: Elimination of Manned Level Crossings

124. Audit noted that except for North West Railway, the shortfall ranged in elimination of manned level crossings in 15 ZRs ranged from 6 per cent (WR) to 61 per cent (ECR).The main reasons cited for delay in completion of the work was delay in finalization of drawing, delay in preparation and sanction of detailed estimates, issues related to land acquisition and non-finalization of cost sharing issues etc.

125. On being enquired about elimination of manned level crossings, the Ministry official during further evidence stated as under:

"One of the achievements of Indian Railways has been that all the unmanned railway crossing gates on broad gauge route have been eliminated by the year 2018-19. It has remarkably improved the safety in operations. Road under bridges and road over bridges are being constructed to eliminate the level crossing gates. Up to the year 2022-23, the number of ROBs and RUBs constructed has crossed 16,600. In the current financial year, up to October 2023, 423 ROBs/RUBs have been constructed and number of manned level crossing gates eliminated up to October 2023 is 240."

126. When asked about the difficulties coming in the way, the Ministry in their written reply stated as under:

"Level crossings (LCs) are eliminated by following methods depending upon site conditions & traffic at Level crossings:-.

i. Direct Closure- Closing level crossing having very less/negligible Train Vehicle Unit (TVU).

ii. Merger- Merger of level crossing with nearby LC or available subway / Road Under Bridge (RUB) /Road Over Bridge (ROB), by construction of diversion road as per requirement.

iii. Provision of ROB/RUBs- ROB/RUB is constructed in lieu of Level crossing.

• As on 30.06.2023, total 1782 ROBs and 2308 RUBs have been sanctioned over all zonal railways, which are in various stages of planning, and execution.

• The level crossings on MG & NG section will be eliminated along with gauge conversion work of the section to BG.

One of the major constraints faced in elimination of level crossings has been allocation of limited funds by state Government for sanction and construction of ROBs/RUBs on cost sharing basis. Comprehensive review of policy has been done by Railway and revised policy dated 02.03.2023 has been issued to remove bottlenecks in sanctioning and for faster execution of these works. As per this policy, 100% cost of work of ROB/RUB at LCs shall be borne by Railways except LCs located on National Highways (NH) and where State Govt /Road Owning Authority/ Local Authority want to take up the works at its cost. The old sanctioned works on cost sharing, where work could not commence due to funds not being arranged by State Government have also been reviewed as per priority, for sanction on Railway cost. This has fast tracked process of sanctioning & execution of works. Other major difficulty experienced in completion and commissioning of ROB is land acquisition at approaches, wherever required. The land acquisition is to be done with State Government by State Govt. for which regular follow up is being done to expedite the land acquisition."

127. On being asked about the zone-wise plan of Indian Railway to achieve 100% elimination of manned level crossings, the Ministry in their written reply stated as under:

"Elimination of Manned level crossing is a continuous process. Zonal Railways are undertaking preparation of DPR/feasibility report for elimination of LCs and works are sanctioned for construction of ROB/RUB depending on the priority, feasibility etc under sanctioned umbrella works. Construction of ROB/RUB, in lieu of level crossings on certain LCs located in congested city area/urban conglomerate, sometimes requires land acquisition in heavy built up area which also has significant bearing on feasibility/executability of works and affect the consent of State Government for closure of LC. Priority of elimination of level crossing (LC) is based on its impact on safety in train operations, mobility of trains, impact for road users and feasibility etc."

128. When asked whether any fund crunch has been experienced in the process of elimination of manned Level Crossings gates, the Ministry in their written reply stated as under:

"Umbrella works have been sanctioned for construction of ROBs/RUBs. As on 01.04.2023, the availability of sanctioned umbrella work is Rs 35040 Crore, out of which funds of Rs. 9947 Crore have been utilized so far for sanction of works. Sanction of works is a continuous process based on feasibility report for construction of ROB/RUB to eliminate manned LCs. For the current year (2023-24), Rs 8000 Cr. (SF- Rs 7400 Cr-SF & EBR (P)-Rs 600 Cr) have been allocated under 'Road Safety Work' Plan Head, out of which Rs 1549 Cr. have been

utilized so far. The Outlay has been sufficiently increased over the years and no funds constraints are experienced in execution of such works."

Para No.6.4: Accidents involving Animals

129. Audit noticed that the important precautionary measures related to provision of signage boards, construction of underpasses, provision of fencing and deputation of forest staff in divisional offices had not been implemented in many sections, even after a lapse of more than 10 years period from the issue of Joint General Advisories by Ministry of Environment & Forests, and Ministry of Railways.

130. When asked as to what action has been taken to fix accountability for not implementing important precautionary measures as stated above, the Ministry in their written reply stated as under:

"Various steps have been taken by Zonal Railways in coordination with Ministry of Environment and Forest to curb the death of animals while crossing railway track, which include the following:

(i) Imposition of speed restrictions in identified locations,

(ii) Provision of signage board for pre-warning the train crew about animal crossing zones.

(iii) Sensitization of Train Crew and Station staff on a regular basis,

(iv) Need based clearance of vegetation on the sides of the track within railway land,

(v) Construction of underpasses and ramps for the movement of wildlife at identified locations,

(vi) Provision of fencing at isolated locations,

(vii) Forest Department staff deputed in Railway control offices to liaison with Railway and elephant trackers engaged by Forest Department for timely action by alerting station master and loco pilots,

(viii) Honey bee sound systems have been installed at locations which are prone to crossing of elephants.

(ix) Counseling of villagers for avoiding cattle coming near track.

(x) Innovative Intrusion Detection System to detect movement of elephant across Railway track has been introduced in Lumding – Hawaipur section (24 Km) of Lumding Division in Assam and in Chalsa – Hasimara section (60 Km) of Alipurduar Division in West Bengal of North East Frontier Railway.

(xi) One work for "Provision of Intrusion Detection system for detection of Elephant movement" costing Rs 77.41 crores has been sanctioned for North East Frontier Railway.

Regular inspections at different levels are conducted to check the above measures taken in different sections and shortcomings noticed are made good at the earliest. Necessary instructions to defaulting officials are issued for immediate compliance. Important measures like following of speed restrictions are strictly followed by train crew without fail, as directly related to safety".

131. On being enquired about the timeframe within which the Indian Railway propose 100% elimination of level crossings in forest passages to reduce the safety hazards for animals, the Ministry in their written reply stated as under:

"As per latest Railway Board policy dated 02.03.2023, Road Crossing works, in lieu of Level Crossings (LCs), shall be done at railway cost except those on National Highways (NH) and where State Govt. /Road Owning Authority/Local Authority want to take up the works at its cost. To reduce the safety hazards for animals, during construction of new line/multitracking/gauge conversion projects in forest area, Railway is taking required wildlife mitigation measures in consultation with forest authorities."

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PART-II

OBSERVATIONS / RECOMMENDATIONS OF THE COMMITTEE

Introductory

1. The Indian Railway (IR) is one of the world's largest railways. It functions as a vertically integrated organization providing Passenger and Freight services. It is a single system which consists of 67,956 route km of track that traverses the country. More than 21648 number of trains ply on IR carrying about 22.15 million passengers and hauling nearly 3.32 million tonnes of freight every day. Accidents in Indian Railway tarnish the image and raises questions on safe and sound working procedures. Accidents occur on account of acts of omission or commission, evasion of rules, unsafe practices, etc. Out of various categories of accidents, most serious consequences are witnessed in collisions, derailments, fire in running trains and accidents at level crossings accidents etc. There exist statutory rules known as Indian Railways (Open Lines) General Rules (GR), 1976 to regulate safe operation of trains. These Rules have been notified as per the powers delegated by the Railways Act, 1989. These Rules are further supplemented by Zonal Railways, by way of issuing Subsidiary Rules (SR), to ensure safety, punctuality and mobility. All new Railway lines for the public carriage of passengers and major modifications of existing systems require inspection and clearance by the Commission of Railway Safety (CRS), which is an independent organization under the administrative control of Ministry of Civil Aviation. A dedicated Safety department operates as an internal auditor in the Railways at three tiers, *viz.* Railway Board Level, Zonal Level and Divisional Level. A number of initiatives and safeguards have been taken continuously in the past to improve the safety performance, as a result of which the safety of Railways has been claimed to have improved over the years. Some of the issues contained in the Audit Report have been examined by the Committee and commented upon suitably in the succeeding paragraphs.

Monitoring by Track Recording Cars

2. Track Recording Cars (TRCs) are specialized vehicles that inspect the geometrical and structural conditions of Railway tracks, identifying defects that could lead to derailment and other accidents. The Committee note from the Audit observation that there were shortfalls in inspections by Track Recording Cars which ranged between 30 per cent and 100 per cent in TRC inspections which has had an adverse impact on the quality of railways assets and also implications on safe operation of trains on various routes. The Committee also note from one of the 'accident inquiry reports' that the derailment of Seemanchal Express

occurred in February 2019 in ECR wherein it was stated that the TRC run over the section was overdue by four months. Had the TRC run been carried out, it could have given vital inputs on possible defects in track. The main reason assigned for the shortfall in the inspections, as informed to the Committee include, non-receipt of the programme for the running of TRCs to be prepared and finalized by Research Designs & Standards Organization (RDSO), Lucknow. From the submissions made by the Ministry, the Committee note that there has been shortfall in frequency of track recording vis-à-vis, the stipulations due to limited number of Cars as also faulty planning. Consequently, the target of inspections by TRCs could not be achieved. Besides, the problem was aggravated due to break downs, scheduled maintenance of Track Recording system, non-availability of path on congested traffic sections etc. The Ministry in their submission to the Committee have stated that in case of non availability of TRC, alternative means i.e. Oscillation Monitoring Systems were deployed and attention to track maintenance issues is given based on the result. The Committee however, cannot endorse the argument that additional runs of Oscillation Monitoring System (OMS) have been carried out for monitoring the health of the track, as an alternative to, or in lieu of track recording by TRCs as these systems serve separate purposes. While OMS assesses the ride quality of the track, the actual track geometry is recorded by the TRC. The Committee further note from the submission of the Ministry that to address the shortfall, steps like commissioning and procurement of 2 new TRCs each and sanction of 7 more TRCs have been done (including 04 additional TRCs and replacement of 03 old TRCs). The Committee recommend that the Ministry take steps to make sure that TRCs are put to full utilization and a time-bound utilization certificate reflecting stipulated periodicity, length of track recording, time taken to complete the given stretch and consequential action for those falling short of the target be made mandatory. The Committee are of the view that instead of procuring TRCs in batches, the required number of TRCs should be estimated well in advance and procured straightaway in a time bound manner as this would not only put an end to the recurrent shortage/maintenance issues but would also, at the same time, prevent accidents/derailments caused on account of shortfall in frequency of track recording due to limited number/shortage of TRCs. The Committee desire that the Ministry set a target for 100 percent track recording by the year 2025. The Committee also desire that a compliance report in the matter regarding procurement of Track Inspection and Monitoring Systems and Zero Speed Integrated Track Monitoring Systems be submitted to the Committee.

Outsourcing of track maintenance activities

3. From the audit observation, the Committee find that the status of outsourcing was found to be inadequate as against the required number of work force of the Civil Engineering Department. Though the percentage of vacancies in Indian Railways for Civil Engineering Department ranged between 9-36 per cent, no outsourcing was done in East Central Railway for addressing the problem of shortage of work force in divisions selected for review. From the submissions of the Ministry, the Committee note that accident Inquiry reports of the zone revealed that in 23 per cent of the total derailments (40 out of 172) in East Central Railways, one of the factors responsible for the derailment was improper track maintenance. Despite the fact that the three Zonal Railways viz. North Central Railways, North Frontier Railway, and West Central Railway had more than seven percent vacancies, no serious efforts seem to have been made for filling up the vacant posts nor outsourcing was done in any of these Zonal Railways. The Committee further note from the submission of the Ministry that the total Non-gazetted Group 'C' (including level – 1) vacancies in Civil Engineering department of Indian Railways as on 01.07.2023 was 68619. During 2018- 2019 to 2022-2023, 11784 (Provisional) candidates had been empanelled in Civil Engineering Department (for Group 'C' posts excluding Level 1) by 21 Railway Recruitment Boards (RRBs). The Committee are of the view that adequate monitoring mechanism should be worked out to maintain a 'Database' containing the details of track maintenance by the permanent staff and the extent of shortage of staff that needs to be met by outsourcing. The Committee are also of the view that the Ministry need to work out a mechanism preferably in the form of an 'Outsourcing Coordination Cell' to ensure that a viable 'Stop-Gap' arrangement to address the issue of shortage of 'permanent or regular staff' is taken care of by way of engaging qualified contractual staff. The Committee are of the view that the quantum of work based on the field requirement needs to be worked out by the respective units of the division well in advance to make good the shortage of permanent staff and in furtherance of this objective, the 'Outsourcing Coordination Cell' should be entrusted with the responsibility of maintaining the 'Database' with a view to eliminating the possibility of staff requirement-gap; and also to monitor, assess and grade the outsourced staff. The Committee recommend that recruitment of sufficient permanent staff should be carried out at the earliest to ensure regular and reliable supply of workforce and also to make sure that punitive actions are initiated against those found responsible for any negligence or breaking the established rules which cause accidents/derailments.

Mechanization of track maintenance activities

4. The Committee note from the audit observation that idling of track machines due to 'block not given by the Operating Department' and 'Stabled due to operational problems' was found in all the twelve Zonal Railways; in eleven Zonal Railways, the track machine was kept idle for 13 to 1881 days due to 'non-availability of track machine staff'. Also, 'idling of track machines' due to 'block not planned by divisions' and 'programme not planned by Track Machine Office' was noticed in ten Zonal Railways. From the submissions of the Ministry, the Committee note that track machines are being used for track renewal work as well and mechanization work too is being carried out as part of the track renewal activity. Besides, the quality of the work is ensured by laying the tracks with the help of track machines and a good number of machines have been inducted for the maintenance work which is being carried out with the help of automatic machines which ensures the quality of maintenance. The Committee also note from the submissions of the Ministry that Satellite Track Machine Maintenance Depots (STMMD) are being set up in each Division to ensure timely maintenance of machines and improved quality. The Committee feel that there have been cases of idling of track machines due to various reasons which has hampered the process of mechanization of track maintenance activities and are of the view that the Ministry need to develop an inbuilt mechanism to make sure that track machines are not kept idle and are put to maximum use. The Committee recommend introduction of the ground penetrating Radar (GPR) for Ballast Bed condition evaluation as soon as possible. The Committee also recommend that human intervention in the activities of track maintenance services be minimized and mechanized maintenance work be maximized which would not only speed up the maintenance Process and eliminate the angle of human error in the process of track maintenance and thereby infuse more confidence on safety issues.

Introduction of wider and heavier pre-stressed concrete sleepers

5. The Committee note from the audit observation that Research Design and Standard Organization (RDSO) had developed a new wider and heavier pre-stressed concrete sleeper (RT-8527) for Indian Railways to keep pace with the increased freight traffic by allowing higher axle load on existing track. The Committee find that despite Railway Board directive issued *vide* letter dt. 17.10.2018 communicating its approval on usage of wider and heavier sleepers (RT-8527) from financial year 2019-20 onwards, the sleepers were not used by some zonal railways at the time of track renewal due to non-availability of the rate reference in Indian Railways Projects Sanctions and Management (IRPSM) and web based application for RT-8527 sleepers at the stage of preparing detailed estimates. The Committee further note from the submissions of the Ministry that

the tender for procurement of wider sleepers (RT-8527) was finalized by the Board in May, 2019 with provision of mobilization period of 4 months for shifting to production of wider sleepers. Accordingly, Zonal Railways started production of wider sleepers from September 2019 onwards and started using wider sleeper (RT-8527) based on availability of wider sleepers & its matching fittings. The Committee note from the submission of the Ministry that Zonal Railways also continued using normal sleepers (RT2496) till the stocks and matching fittings were available, with a view to avoiding wastage of resources. In this regard, the Committee concur with the audit observation that there is a need to upgrade and standardize the existing track structure for 25 tonne axle load on IR, as the existing sleepers are slender and lightweight and are less fit for higher impact load caused by flat wheels which may lead to premature failure of sleepers and consequently rail disasters in the form of derailment/accidents. The Committee are not convinced with the explanation furnished by the Ministry and are of the view that sleepers that are lightweight and are less fit for higher impact load should be replaced on war footing with PSC sleepers and a target oriented working/monitoring group should be put in place to make sure that the recommendations of the Railway Board for use of PSCS is implemented both in letter and spirit without further delay. The Committee are of the view that the idea of 'avoiding wastage of resources till old stocks last' should not in any way override issues of safety. The Committee also desire that the Ministry furnish a compliance report on use of PSCS as per the advisory of the Railway Board.

Alumino Thermit and Flash Butt Welding

6. The Committee note from the audit observation that while the targets in respect of the less preferred AT welding (manual process) were achieved, there was shortfall in achievement of targets for the more preferred FB welding and that the Railway administration failed in implementing the directives issued on rail welds in the 'Corporate Safety Plan of IR' (2003-13). From the audit observation, the Committee also note that the Railway Board reiterated (August 2019) that the elimination of AT welding except in emergency shall be the way forward. From the submissions of the Ministry, the Committee note that the concerned zonal Railways have listed reasons like, unavoidability of use of AT welds for regular maintenance, use of AT welding where FB welding is not economical, non-fixation of targets for removal of AT welds and isolated welding as the reasons for opting for the less preferred AT welding. In response to the recommendation of the Standing Committee on Railways, the Ministry had stated that technology upgradation in laying and maintenance of track is being carried out continuously including switching over to mobile FB welding technology in place of AT welding to carry out weld renewals. The Committee note that AT

welding was given more weightage over FB Welding which is indicative of a lackadaisical approach practiced towards implementation of Railway Board directives and also towards the recommendation of the Standing Committee on Railways which clearly that expressed the view elimination of AT welding except in cases of emergency should be 'the way forward'. The Committee opine that advocacy of use of AT welding, where FB welding is not economical, does not hold much ground, as safety of human life should be given precedence over economics of scale. The Committee are of the view that the Ministry need to work out a timeline for completion of replacement of AT welds with FB welds and a monitoring mechanism should be put in place to oversee the process on a regular basis till the objective is achieved. The Committee desire to be apprised of the timeline fixed in this matter.

Ultrasonic Flaw Detection Testing

7. From the audit observation, the Committee note that there were shortfalls in USFD testing in rails and welds during 2017-2021. The ultrasonic flaw detection system is used in Indian Railways for detection of flaws in railways to enable timely removal of defects. The Committee note with dismay that whereas this shortfall was 50 percent in the Northern Railways in respect of USFD testing in rails, it reached as high as 100 percent in the East Coast Railway in respect of USFD testing on welds. The Committee note from the reply of the Ministry that Indian Railway has already adopted a web enabled Track Management System (TMS) to ensure monitoring of the track inspection and maintenance activities at various levels of Railway working and that Alarm/Reminder is provided by TMS for any location of rails & welds due for USFD testing, based on which planning and deployment of USFD testing team is done. The Committee note that there have been instances in the past when derailments have taken place because of rail breakage. The Ministry has informed that the USFD testing is being done in the range of 305 thousand track kilometer per year and USFD testing is being done for weld and the number has increased to 2533 thousand welds per year and that to meet the shortfall over and above the departmental resources, outsourcing agencies are made available over and above the departmental workforce. The Committee are of the view that the Ministry need to work out a mechanism advisably in the form of a 'USFD testing Monitoring Cell' to make sure that there is no shortfall in USFD testing in all Zonal Railways and also to ensure that there is no demand gap in terms of departmental workforce to carry out this task. The Committee are of the view that the conventional method of using trolleys for USFD of rails is becoming increasingly difficult as repair window shrinks due to train speed reaching above 130 kmph. The Committee recommend that self-propelled Ultrasonic Rail Testing (SPURT) Cars should be inducted at

the earliest. The Committee also note that efforts made to introduce SPURT Cars in the past have not been successful and recommend that the Ministry should make earnest efforts to procure SPURT Cars as soon as possible and furnish a compliance report about the procurement of SPURT Cars. The Committee are of the view that more technologically advanced tools on the pattern of web enabled Track Management System should be explored and implemented in order to ensure shielding from human error in USFD testing procedure.

Maintenance of 'Yard Lines'

8. The Committee note from the observation of the audit that against the demand of 7339:28 hours for Yard line maintenance, only 4667:56 maintenance block hours were granted by the Zonal Railways during 2017-2021. The Committee note from the submissions of the Ministry that the reasons for the shortfalls were due to the agencies not turning up to execute the work in time, less number of blocks granted against those demanded and non-availability of materials, etc. The Committee also note from the submissions of the Ministry that there is a concept of corridor block which is inbuilt in the working time table issued by Zonal Railways. Further, Joint Procedure Orders (JPOs) from the Engg. & Traffic Dte. have been issued to Railways for advance planning of traffic blocks for maintenance of assets. Recently, system of Rolling Block Plan (RBP) has been introduced at Divisional level for advance two week block planning for maintenance of assets by different departments working in same block to avail maximum benefits of traffic blocks, which is reviewed on weekly basis by the Divisions and Zonal Railways. Besides, works are executed by the outsourcing agency based on detailed planning for supply of men and machinery etc required for the work. Regular monitoring of progress is being done by Railway officials linked with the execution of works. Action in terms of conditions of contract is taken in case of delay attributable to the contractor. The Committee feel that there is a yawning difference in the demand hours and supply hours for maintenance and there is a need to bridge the gap. The Committee are of the view that there is a need to increase absolute block hours granted. The Committee are also of the view that stricter control needs to be exercised over the outsourced agencies involved in this work and the conditions of contract should be reworked to ensure complete compliance. The Committee desire that the Ministry furnish a compliance report to them in the matter.

Inspections by Higher Authorities

9. The Committee note from audit observation the discrepancies in the ratio of route kilometer with average number of inspections in various zonal railways. Notably, in South East Central Railway, higher officials did not carry out any inspection, though the zone has 2348 route km which constitutes around 4 per cent of total of Indian Railways' Broad Gauge line. No standard criterion was set for number of inspections to be conducted by higher authorities and hence, there is no accountability for the meagre number of inspections undertaken. The

Committee note from the submission of the Ministry that detailed schedule of inspection of field officials (JE/SSE/ADEN) has been stipulated in IRPWM and in addition, the guidelines for inspection by Divisional officers have been issued by Railway Board. Yet, no specific inspection schedule is prescribed for higher ranking officers at the Headquarters. However, as stated by the Ministry, Headquarter level officers carry out the technical inspections *suo motu* and also during the safety drives launched from time to time, which are scrutinized on completion of such safety drives. The Committee opine that a target based inspection module needs to be worked out not only for the junior and middle level officers but also for high level authorities who would not only play a monitoring role for inspections but also conduct real time inspection at given time intervals which should be on a monthly basis in place of annual inspection. The Committee also observe that inspection notes were not uploaded in the Track Management System(TMS) portal and compliance to the notes was not available in many cases during field visits to the Senior Section Engineer office. Thus, the in-built monitoring mechanism including the TMS portal was not found to be properly operational. The Committee are, therefore, of the view that the Ministry need to fine-tune the system to the targeted standards so as to make the inspection system meaningful and beneficial. The Committee note that in accordance with the functions laid down in the Railway Act, 1989, a thorough inspection is carried out by the Commission of Railway Safety only when commissioning is done for a new asset which maybe a new line, or doubling a line, or a gauge conversion project, before opening any new asset. The Committee also opine that the office of Commission of Railway Safety which operates under the control of the Ministry of Civil Aviation may be directly involved in the inspection process as an independent and dispassionate agency and the Commissioner of Railway Safety should carry out safety audit in five Railway divisions every year and submit a structured safety audit report on which the Indian Railways (Railway Board) may record their inputs and action taken. The Committee desire that the proposal be examined and related details furnished at the earliest.

Training of track maintenance officials

10. The Committee note from the audit observation that 794 officials dealing with track maintenance activities were not given training at various levels be it the induction level or refresher course level and there were also shortfalls in conducting training at supervisory level such as SSE/JE/P. Way in many Zonal Railways. The reasons for the shortfall in imparting training at various levels were mainly attributed to Covid-19 situation, staff not being spared due to special work and other assignments, non-receipt of training schedule in the units and non-updating of information of employees in Track Management System (TMS) etc. From the submission of the Ministry, the Committee note that all safety category railway employees are to be imparted structured training at various stages of their career which includes, Simulator-based training imparted for improving the driving skills and reaction time of Loco Pilots; Training module formulated for running staff on Fire Fighting and use of fire extinguishers; Regular counseling of

running staff etc. and that It has been the constant endeavor of Railways to develop Human Resources. From the information furnished, the Committee note that during 2022-23, all employees have not been given different types of training *viz.* initial, promotional, refresher & specialized. The Committee take a grim view of the position and feel that there have been gaps in providing training at different levels of officers/staff and are of the view that the Ministry needs to develop a mechanism to ensure that there are no shortfalls in the training programmes at any point of time and the limitations attributed as reasons for the shortfall are addressed systematically. The Committee are of the view that officials need to be encouraged to undergo internationally recognized certification courses to develop proficiency. The Ministry should also consider examining the feasibility of collaborating with IITs and IIMs to develop specilised courses aimed at offering advanced technical and management training to officers. The Committee also recommend that an independent supervisory body be constituted to formulate and monitor training schedules and prepare a monthly report containing details of implementation of training programmes and also to ensure that no untrained hand is deployed for duty for any reason.

Analysis of Accidents/Derailments in Indian Railways and introduction of safety measures

11. The Committee note from the audit observation that the factors causing maximum derailments (395) were in 'Engineering Department' followed by 'Operating Department' (173). Out of several factors attributed, the major factor responsible for derailment related to 'maintenance of track' (167 cases), followed by 'deviation of track parameters beyond permissible limits' (149 cases) and 'bad driving/over speeding' (144 cases). From the submission of the Ministry, the Committee note that measures to reduce derailments have been taken like track renewal and maintenance; track upgradation consisting of 60kg, 90 Ultimate Tensile Strength (UTS) rails; Pre-stressed Concrete Sleeper (PSC); Welded Rails on most of BG tracks wherein short-welded rails of 39m length and single rails have been converted into long welded rails; reduction in population of Alumino-Thermit (AT) welds gradually by using longer rail panels with one/two/three Flash Butt weld (FB) from rail manufacturing plant; Track Recording wherein Supercheck of track parameters is done through regular runs of Track Recording Cars (TRC) and regular bridge inspection. Besides, Measures have been taken to avoid collisions through introduction of Advanced Signaling System, Panel Interlocking/Route Relay Interlocking/Electronic Interlocking (PI/RRI/EI) along with Multiple Aspect Colour Light Signals, Block Proving Axle Counter (BPAC) to ensure complete arrival of train without manual intervention before granting line clear to the next train; Development of India's own state-of-the-art electronic system Automatic Train Protection (ATP) System named KAVACH (Train Collision Avoidance System) by RDSO, which activates the train braking system automatically if the Loco Pilot fails to control the train as per the speed restrictions. However, the system to be an effective safety measure, all need to

have the KAVACH system. The Committee, therefore, recommend that a time bound programme for installation of KAVACH system in all divisions/Routes should be taken up by the Ministry. The Committee note from the report of the CCRS on the accident that not adhering to the standard practices stipulated in the Manuals and Work Instructions were not followed during the process of signal modification work, owing to which the accident occurred. The Committee are also of the view that training programmes of all levels of officers/staff should be made more vigorous and result oriented. The Committee while taking note of the measures taken to prevent derailments/accidents/collisions nevertheless also feel concerned to observe that despite these measures, the system is still not capable of putting a full stop to such mishaps and loss of lives and property due to accidents continue to happen. Issues like track maintenance, track upgradation and Retro-reflective sigma (∑) boards and electronic interlocking system should be accorded greater priority and should cover all routes/sectors at the earliest and a target should be fixed to achieve a complete makeover towards a zero error and a flawless and accident free operation. The Committee recommend that the Indian Railways need to remodel the operational training programmes keeping in view the five barriers/layers of defense (Swiss Cheese Slices' or 'defense barriers) against accidents/derailments and use this Model as a reference for strengthening the above barriers to avoid occurrence of similar incidents. The Committee also desire to be apprised of the implementation status of this Model and the benefits accruing from it.

Timeliness in completion of inquiries/investigations

12. From the observation of the audit the Committee note that there were delays in different stages of accident inquiries and that the inquiry reports were not submitted to the accepting authority within the time schedule prescribed by Railway Board in 63 per cent cases and also that delays in submission of the inquiry report had a cascading effect on acceptance of the reports by the accepting authority. The Committee also note from audit observation that in 49 percent cases, there was delay in acceptance of the reports by the authorities concerned. The Committee note from the submission of the Ministry that as per complexity of an accident case, multiple witnesses are required to be examined, detailed investigation reports e.g. Metallurgical, Chemical test reports from Laboratories, RDSO, Forensic Examination report from state agencies and other external agencies are required by the Inquiry Committee to arrive at the 'root cause' of the accident for taking corrective and preventive actions. The Committee also take note of the fact that in February 2006, Railway Board had prescribed the timeline of D+10 days for Departmental Inquiry in Consequential Accidents which was revised to D+30 days in view of the complexities in December 2019 and further that the progress of departmental inquiries for their

early finalization is monitored at the highest level at Zonal Railway Headquarters as well as at Railway Board. The Committee observe that delays in stages of accident inquiries and non submission of inquiry reports to the accepting authority within the time schedule prescribed by Railway Board have been playing havoc with the lives and property and are of the view that unwavering commitment to the timeline for inquiries and submission of report to the accepting authority must be ensured. The Committee also recommend that effective steps should be taken to prevent any delay in acceptance of the reports by the authority concerned within a reasonable timeframe and punitive mechanism should be put in place to discourage avoidable delays in any respect.

Funding and utilization of RRSK

13. The Committee note from audit observation that there has been an assured annual funding of Rs.15000 crore out of the 'Gross Budgetary Support. However, an annual amount of Rs.5000 crore (25 per cent) amounting to total contribution of Rs 20,000 from 2017-18 to 2020-21 per year to this fund designed to be met from Railways internal resources had been falling short of target to the tune of Rs. 15775 crore constituting 78.88 % during the years 2017-18 to 2020-21. The Committee also note from audit observation that the physical as well as financial targets in respect of track renewals need to be enhanced as per the annual requirement for track renewals for safety. From the submission of the Ministry the Committee note that during this period, Railways' internal resource generation was adversely affected following Covid Pandemic which led to passenger trains completely halting and freight trains running with only essential commodities. Further, despite the pandemic and other recessionary conditions, IR provided funds for incurring gross expenditure of Rs.1.08 lakh crore on RRSK works from 2017-18 till 2021-22. Besides, with the improvement in the net revenue position on account of higher incremental loading and passenger revenues along with astute expenditure management, MoR is able to supplement RRSK from 2022-23. The Committee also note from Ministry's submission that in 2022-23, the Government has extended the currency of RRSK for another period of five years w.e.f. 2022-23 with total Gross Budgetary Support of Rs.45000 crore. Against Revised Estimate 2022-23 provision of Rs.1000 crore to RRSK from internal resources, IR has contributed Rs.1797 crore considering requirement of funds. In addition, in 2023-24, Rs.1000 crore from internal generation of resources have been budgeted. Regarding fulfillment of target for renewal of tracks, the Committee note from submission of the Ministry that due to assured funding under RRSK, the Budget allocation and expenditure over Indian Railway network for track renewal works has almost doubled from 2017-18 to 2023-24 and there has been no deficit of funds for RRSK works, which have progressed as per their targets. The Committee feel that generation of internal resources has seen an aberrant trend and has been falling short of the target and the resultant short deployment of

funds by Railways from internal resources to the tune of Rs. 15,775 crore (78.88 per cent) out of the total share of Rs. 20,000 crore had defeated the primary objective of creation of RRSK to support absolute safety in Railways. The Committee are of the view that funding to and expenditure from RRSK for safety purposes should be ensured at highest level in order to accord paramount importance to safety. The Committee are also of the view that the Ministry need to set up a 'Financial Task Force' to trace the reasons causing decline in the generation of internal resources and find ways to develop the resources to ensure funding to the RRSK and its use for critical safety works. The Committee also desire to be apprised of the latest status of the same.

Fire accidents in coaches

14. The Committee note from audit observation that out of the identified 44,407 coaches on 12 ZRs, fire extinguishers have not been provided in 27,763 (62 per cent) coaches. The reasons attributed for non-provision of fire extinguishers include delays in tendering processes, failure of firm to supply the fire extinguishers, supply awaited/under progress etc. The Committee note from reply of the Ministry that measures like usage of fire retardant furnishing materials in coaches, provision of fire detection and suppression system in Power Cars and Pantry Cars and Fire and Smoke detection system in AC coaches, provision of fire extinguishers in all AC coaches and all newly manufactured Non-AC coaches and Display of statutory "Fire Notices" for widespread passenger information in all coaches have been taken and fire extinguishers have been installed in 39000 coaches. Besides, till now, Indian Railways has provided fire detection cum suppression system in nearly 1775 Power Cars and 800 Pantry Car Coaches. Fire detection cum alarm system has been provided in nearly 11,000 AC Coaches and fire extinguishers have been provided in nearly 34700 Non AC coaches and that it is planned to cover all coaches with fire safety system by March 2024. The Committee while acknowledging the steps taken by the Ministry observe that there is still much left to be desired as regards installation of fire extinguishers. The Committee are of the view that the tendering/procurement process needs to be reworked to make sure that supply of fire extinguishers and their installation is not hindered in any way and the target of covering all coaches with fire safety system by March 2024 is met without fail. The Committee desire that a strict protocol for inspection, service and maintenance of fire extinguishers should be put in place. The Committee are of the considered view that a comprehensive Fire Risk Assessment of trains and stations should be conducted by an independent agency/Authority to enable the Ministry to formulate a comprehensive Fire Safety protocol for Indian Railways. The Committee also feel that Fire Safety Audits should be conducted at regular intervals for assessing the preparedness in Indian Railways against fire hazards.

Level Crossings on Indian Railway

15. The Committee note from audit observation that except for North West Railway, the shortfall in elimination of manned level crossings in 15 ZRs ranged from 6 per cent (WR) to 61 per cent (ECR) and the main reasons cited for delay in completion of the work was delay in finalization of drawing, delay in preparation and sanction of detailed estimates, issues related to land acquisition and non-finalization of cost sharing issues etc. From the submission of the Ministry, the Committee note that all Unmanned Level Crossings (UMLCs) on Broad Gauge (BG) routes on Indian Railways have been eliminated by 31.01.2019. Elimination of Manned Level Crossing gates is under process, by provisioning for Road Under Bridges (RUB) and Road Over Bridges (ROB) at these locations, and the priority of elimination of level crossing (LC) is based on its impact on safety in train operations, mobility of trains, impact for road users and feasibility etc. The Committee further note from the reply of the Ministry that one of the major constraints faced in elimination of level crossings has been allocation of limited funds by state Governments for sanction and construction of ROBs/RUBs on cost sharing basis. The Committee note that a Comprehensive review of policy has been done by the Railways and the revised policy dated 02.03.2023 has been issued to remove bottlenecks in sanctioning and for faster execution of these works. As per revised policy, 100% cost of work of ROB/RUB at LCs shall be borne by Railways except LCs located on National Highways (NH) and where State Govt /Road Owning Authority/ Local Authority want to take up the works at their own cost. Besides, the level crossings on MG & NG sections will be eliminated along with gauge conversion work of the section to BG. While appreciating the fact that all Unmanned Level Crossings (UMLCs) on BG routes on Indian Railways have been eliminated and the revision of earlier policy has been effected with a view to fastening of the process of elimination of remaining Manned Level Crossings, the Committee observe that there is still much space left for expediting and completing the left over Level Crossings in the categories of Broad Gauge, Metre-Gauge and Narrow Gauge. The Committee are of the view that a special cell may be created to see to it that all bottlenecks in completely eliminating level crossings are removed and all level crossings are done away with by the year 2025. The Committee also recommend that chances should not be taken with Metre-Gauge and Narrow Gauge level crossings either and elimination of level crossings irrespective of category should be the priority over anything else particularly in view of the fact that availability of finances has not been a hindrance. The Committee desire to be apprised of the latest developments and decisions taken by the Ministry in the matter.

Accidents involving Animals

16. The Committee note from the audit observation that important precautionary measures related to provision of signage boards, construction of underpasses, provision of fencing and deputation of forest staff in divisional offices has not been implemented in many sections, even after a lapse of more than 10 years following the issue of Joint General Advisories by Ministry of Environment & Forests, and Ministry of Railways. The Committee note from the submission of the Ministry that to reduce the safety hazards for animals, during construction of new line/multitracking/gauge conversion projects in forest area, the Railway is taking required wildlife mitigation measures in consultation with forest authorities like imposition of speed restrictions in identified locations, Provision of signage board for pre-warning the train crew about animal crossing zones, need based clearance of vegetation on the sides of the track within railway land, construction of underpasses and ramps for the movement of wildlife at identified locations, provision of fencing at isolated locations, deployment of forest Department staff in Railway control offices to liaison with Railway and elephant trackers engaged by Forest Department for timely action by alerting station master and loco pilots and installation of honey bee sound systems at locations which are prone to crossing of elephants. Besides, regular inspections at different levels are conducted to check the above measures taken in different sections and shortcomings noticed are made good at the earliest and necessary instructions to defaulting officials are issued for immediate compliance. The Committee are of the view that Road Crossing works, in lieu of Level Crossings should exclusively be carried out by the Railways without leaving this job to State Govt. /Road Owning Authority/Local Authority. The Committee also recommend that a database be prepared against those held accountable for not implementing important precautionary measures as issued by Joint General Advisories by Ministry of Environment & Forests and Ministry of Railways and action be taken promptly and without fail.

Conclusion

17. Proper maintenance of the railway tracks is a pre-requisite for operating the trains without the occurrence of accidents. Mechanized maintenance should be prioritized as far as possible and human intervention should be kept to the minimum. For this purpose, there is a need for new machines and advanced technologies like B Scan USFD machine, Phased Array Ultrasonic Testing etc. Tracks which are of concrete sleepers should normally be maintained by heavy on-track machines. Provisions of integrated maintenance blocks/traffic blocks/corridor blocks for timely maintenance of assets on all routes including yard lines need to be given greater emphasis to prevent accidents. In October 2018, the Railway Board had directed for usage of wider and heavier PSC

sleepers (RT-8527) on all tracks from 2019-20 onwards which is a welcome step in the direction of safety. Similarly, action plan for gradual replacement of flash butt (FB) welds in place of Alumino Thermit (AT) welds had been envisaged in Corporate Safety Plan (CSP) 2003-13. Despite the efforts made in this direction hitherto, there is much room left for achievement of the final goal and the process requires to be fast tracked. Training and certification as per International Standards and as prescribed in manuals, to the officials dealing with track maintenance, training and certification of welders in particular, and also conducting regular medical examination at prescribed intervals are some of the key areas to be given attention to, which would go a long way in developing a fatality free performance of the Railways.

With a view to ensuring safety and security of the passengers, as also property including that of the railways, it is imperative that the government takes the observations/ recommendations made in this report with utmost seriousness. The Committee ordain that the details of the action taken be informed to the Committee in clear termswithin a time frame of six months from now.

NEW DELHI:
05 February, 2024
16 Magha, 1945 (*Saka*)

ADHIR RANJAN CHOWDHURY
Chairperson,
Public Accounts Committee

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